```
=> d que l50
L1             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  US20040151987/PN
L3             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  "VINYLETHYLENE CARBONATE"
                 /CN
L4             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN
L5             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  SILICON/CN
L6         78262 SEA FILE=REGISTRY ABB=ON  PLU=ON  SILICON?/CN
L7            11 SEA FILE=REGISTRY ABB=ON  PLU=ON  VINYLETHYLENE CARBONATE?/
                 CN
L8       1256158 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L4 OR COPPER OR CU
L9       1448948 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5 OR L6 OR SILICON?
L10          265 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3 OR L7 OR  VINYLETHYLENE
                  CARBONAT?
L11           26 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3/D  OR L3/DP OR L7/DP
                 OR L7/D
L12          265 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11
L13        18754 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "BATTERY ANODES"+PFT,NT,OL
                 D,NEW/CT
L14         2727 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L13
L15            1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L1
L16            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L12
L17        71789 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SECONDARY BATTERIES"+PFT,
                 NT,OLD,NEW/CT
L18           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L12 AND L17
L19           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L12 AND (BATTER?
                 OR ANOD? OR CATHOD? OR ELECTROD?)
L20           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 OR L19
L21            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 AND L9
L22           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 OR L16 OR L20 OR L21
L23       121454 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND (L13 OR L17 OR
                 BATTER? OR ANOD? OR CATHOD? OR ELECTROD?)
L24        13595 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 AND L9
L25            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND L12
L26          645 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND  (CURRENT
                 COLLECT? OR COLLECT?)
L27          467 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND ELECTROCHEM?/SC,SX

L28            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L27 AND CYCLIC CARBONAT?
L29            7 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND CYCLIC CARBONAT?
L30           14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 OR L25 OR L28 OR L29
L42          163 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 AND (L13 OR L17 OR
                 BATTER? OR ANOD? OR CATHOD? OR ELECTROD?)
L43            1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND COPPER FOIL?
L44           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND L8
L46          109 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND  (NEGATIVE
                 ELECTROD? OR ANOD?)
L47            2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L46 AND CURRENT(A)COLLECT?

L48            6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L46 AND COLLECT?
L49           13 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L43 OR L44 OR L47 OR L48
L50           17 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 OR L30


=> d l50 1-17 ibib ed abs hitstr hitind

L50  ANSWER 1 OF 17  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2007:561581  HCAPLUS  Full-text
DOCUMENT NUMBER:          146:524976
TITLE:                    Secondary batteries with anodes
```

containing silicon and oxygen

INVENTOR(S): Kawase, Kenichi; Konishiike, Isamu; Hirose, Kiichi; Iwama, Masayuki; Takada, Tomoo; Kato, Yoshikazu

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| JP 2007128765 | A | 20070524 | JP 2005-321014 | 20051104 |

PRIORITY APPLN. INFO.: JP 2005-321014 20051104

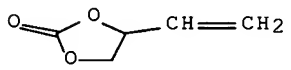
ED Entered STN: 24 May 2007

AB The title **battery** is equipped with an **anode** active mass layer containing Si and O formed on a **current collector** and an electrolyte solution containing sultone. The **battery** provides high capacity and suppressed expansion.

IT **4427-96-7**, 4-Vinyl-1,3-dioxolan-2-one
(electrolyte solns. containing; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

RN 4427-96-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST silicon oxygen **anode** secondary **battery** electrolyte sultone

IT **Secondary batteries**
(lithium; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

IT **Battery anodes**
**Battery** electrolytes
(secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

IT Lactones
(sultones; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

IT 7440-21-3, Silicon, uses 7631-86-9D, Silicon oxide, nonstoichiometric 12017-00-4, Cobalt dioxide 113443-18-8, Silicon oxide (SiO)
(**anodes** containing; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

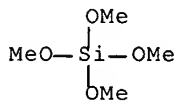
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 872-36-6, 1,3-Dioxol-2-one 1120-71-4, 1,3-Propanesultone **4427-96-7**, 4-Vinyl-1,3-dioxolan-2-one 21806-61-1 114435-02-8, 4-Fluoro-1,3-dioxolan-2-one
(electrolyte solns. containing; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing

sultone)
IT 21324-40-3, Lithium hexafluorophosphate
(electrolytes; secondary **batteries** with **anodes** containing silicon and oxygen and electrolytes containing sultone)

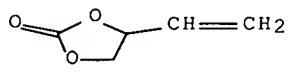
L50 ANSWER 2 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:286926 HCAPLUS Full-text
DOCUMENT NUMBER: 146:341042
TITLE: **Cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor
INVENTOR(S): Nakanishi, Tetsuo; Kashida, Meguru; Miyawaki, Satoru
PATENT ASSIGNEE(S): Shin-Etsu Chemical Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 14pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2007059597 | A1 | 20070315 | US 2006-519849 | 20060913 |
| JP 2007077075 | A | 20070329 | JP 2005-267112 | 20050914 |
| CN 101003630 | A | 20070725 | CN 2006-10064194 | 20060914 |
| PRIORITY APPLN. INFO.: | | | JP 2005-267112 A | 20050914 |

ED Entered STN: 16 Mar 2007
AB A siloxane modified with a **cyclic carbonate** of the formula: is combined with a nonaq. solvent and an electrolyte salt to form a nonaq. electrolytic solution, which is used to construct a secondary **battery** having improved temperature and cycle characteristics.
IT **681-84-5**, Tetramethoxysilane **4427-96-7**, Vinyl ethylene carbonate
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
RN 681-84-5 HCAPLUS
CN Silicic acid (H4SiO4), tetramethyl ester (CA INDEX NAME)



RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IT 7440-50-8, **Copper**, uses
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

INCL 429188000; 528025000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **cyclic carbonate** siloxane aq electrolyte secondary lithium **battery** capacitor
IT Silanes
(butylene carbonate-substituted; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT **Battery** electrolytes
Condensation reaction
Polymerization
Solvents
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Silanes
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Salts, uses
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Polysiloxanes, uses
(cyclolinear, dioxolanone- substituted; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Polysiloxanes, uses
(dioxolanylethyl group-containing; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Electric capacitance
(discharge capacity, cycling effects on; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Electrolytes
(for capacitor; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT **Secondary batteries**
(lithium; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)
IT Viscosity
(of electrolyte solns.; **cyclic carbonate**

-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT Hydrolysis
(of silanes; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 929213-17-2P
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 929213-18-3P
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 16941-12-1, Chloroplatinic acid
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 7664-93-9, Sulfuric acid, uses
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 108-88-3, Toluene, uses
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 929213-12-7P 929213-13-8P 929213-15-0P 929213-16-1P
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 929213-19-4P 929213-20-7P
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 96-49-1D, 1,3-Dioxolan-2-one, silyl-containing derivs. **681-84-5**, Tetramethoxysilane 1112-39-6, Dimethyldimethoxysilane 1825-61-2, Trimethylmethoxysilane 2487-90-3, Trimethoxysilane **4427-96-7**, Vinyl ethylene carbonate 16881-77-9, Methyldimethoxysilane
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 7429-90-5, Aluminum, uses 7439-93-2D, Lithium, salts **7440-50-8**, **Copper**, uses 7782-42-5, Graphite, uses 12597-68-1, Stainless steel, uses 21324-40-3, Lithium hexafluorophosphate 65324-39-2, Celgard 2400
(**cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

IT 929213-14-9P
(oligomeric; **cyclic carbonate**-modified siloxane, method of making, non-aqueous electrolytic solution, secondary **battery**, and capacitor)

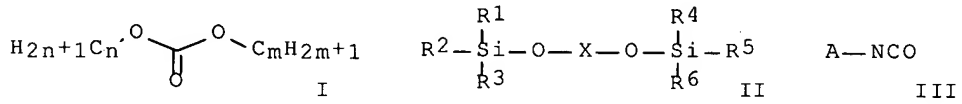
L50 ANSWER 3 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1354131 HCAPLUS Full-text
DOCUMENT NUMBER: 146:125290
TITLE: Nonaqueous electrolyte solution, and secondary nonaqueous electrolyte **battery** using the solution

INVENTOR(S): Shima, Noriko
PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan
SOURCE: PCT Int. Appl., 105pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2006137224 | A1 | 20061228 | WO 2006-JP309423 | 20060510 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | | |
| JP 2007035616 | A | 20070208 | JP 2006-166307 | 20060615 |
| PRIORITY APPLN. INFO.: | | | JP 2005-183846 A | 20050623 |

OTHER SOURCE(S): MARPAT 146:125290
ED Entered STN: 28 Dec 2006
GI




I II III

AB The electrolyte solution contains ≥1 of (i) a compound I (n is integer ≥ 3; and m is integer ≥1; n+m ≥5; and a part or whole hydrogen atoms may be substituted by F atom) and a saturated **cyclic carbonate**, (ii) a compound II (X = -SO2 or -SO; and R1-6 = unsubstituted alkyl group, or alkyl group substituted by halogen atom), and (iii) a compound III-1 (A = element other than H, or a group). The **battery** has a Li-intercalating **cathode**, a Li-intercalating **anode**, and the above electrolyte solution

IT **918298-87-0**, Carbon 12, **copper** 8.1, **silicon** 73
(nonaq. electrolyte solns. for secondary lithium **batteries**)

RN 918298-87-0 HCAPLUS
CN Silicon alloy, base, Si 73,C 12,Cu 8.1 (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** electrolyte additive
IT **Secondary batteries**

(lithium; nonaq. electrolyte solns. for secondary lithium **batteries**)

IT **Battery** electrolytes
(nonaq. electrolyte solns. for secondary lithium **batteries**)

IT 872-36-6, Vinylene carbonate 1118-02-1 3998-25-2, Acetyl isocyanate 4382-03-0, Propanoyl isocyanate 18306-29-1 114435-02-8, Fluoroethylene carbonate 171730-81-7 909009-48-9
(nonaq. electrolyte solns. for secondary lithium **batteries**)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 623-53-0, Ethyl methyl carbonate 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate **918298-87-0**, Carbon 12, **copper** 8.1, **silicon** 73
(nonaq. electrolyte solns. for secondary lithium **batteries**)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 4 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1070175 HCAPLUS Full-text
DOCUMENT NUMBER: 145:422608
TITLE: **Battery** electrolyte using a derivative of **cyclic carbonate** having halogen atoms
INVENTOR(S): Kawashima, Atsumichi
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 12pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2006228625 | A1 | 20061012 | US 2006-278974 | 20060407 |
| JP 2006294373 | A | 20061026 | JP 2005-112051 | 20050408 |
| CN 1845372 | A | 20061011 | CN 2006-10073277 | 20060407 |
| KR 2006107397 | A | 20061013 | KR 2006-31850 | 20060407 |
| PRIORITY APPLN. INFO.: | | | JP 2005-112051 A | 20050408 |

ED Entered STN: 13 Oct 2006

AB A **battery** capable of improving cycle characteristics is provided. A **cathode** and an **anode** are oppositely arranged with a separator in between. An electrolytic solution is impregnated in the separator. The electrolytic solution contains a derivative of **cyclic carbonate** having halogen atoms such as 4-fluoro-1,3-dioxolane-2-one and 4-chloro-1,3-dioxolane-2-one; and a cyclic acid anhydride such as succinic anhydride. The **anode** has an **anode current collector** and an **anode** active material layer which is provided on the **anode current collect** and is alloyed with the **anode current collector** at least at part of the interface with the **anode current collector**.

IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(**battery** electrolyte using derivative of **cyclic carbonate** having halogen atoms)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

INCL 429200000; 429330000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **battery** electrolyte **cyclic carbonate** deriv
IT **Battery** electrolytes
(**battery** electrolyte using derivative of **cyclic carbonate** having halogen atoms)
IT **Secondary batteries**
(lithium; **battery** electrolyte using derivative of **cyclic carbonate** having halogen atoms)
IT 616-38-6, Dimethyl carbonate **7440-21-3, Silicon**, uses 7440-31-5, Tin, uses **7440-50-8, Copper**, uses 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate
(**battery** electrolyte using derivative of **cyclic carbonate** having halogen atoms)
IT 81-08-3, 2-Sulfobenzoic anhydride 81-84-5, 1,8-Naphthalic anhydride 85-44-9, Phthalic anhydride 108-30-5, Succinic anhydride, uses 108-31-6, Maleic anhydride, uses 108-55-4, Glutaric anhydride 319-03-9, 4-Fluorophthalic anhydride 376-68-1, Hexafluoroglutaric anhydride 616-02-4, Citraconic anhydride 652-39-1, 3-Fluorophthalic anhydride 716-39-2, Naphtho[2,3-c]furan-1,3-dione 2170-03-8, Itaconic anhydride 3967-54-2, 4-Chloro-1,3-dioxolan-2-one 4480-83-5, Diglycolic anhydride 5426-09-5, 3,6-Epoxy-1,2,3,6-tetrahydrophthalic anhydride 114435-02-8, 4-Fluoro-1,3-dioxolan-2-one
(**battery** electrolyte using derivative of **cyclic carbonate** having halogen atoms)

L50 ANSWER 5 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1038927 HCAPLUS Full-text
DOCUMENT NUMBER: 145:380405
TITLE: **Anode** for nonaqueous secondary **battery**
INVENTOR(S): Koshina, Hizuru
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 21pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| EP 1708296 | A1 | 20061004 | EP 2005-23975 | 20051103 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU | | | | |
| US 2006222950 | A1 | 20061005 | US 2005-95370 | 20050331 |
| JP 2006286599 | A | 20061019 | JP 2005-296356 | 20051011 |
| CN 1841816 | A | 20061004 | CN 2005-10128545 | 20051128 |
| KR 2006106622 | A | 20061012 | KR 2005-134885 | 20051230 |
| PRIORITY APPLN. INFO.: | | | US 2005-95370 A | 20050331 |

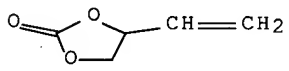
ED Entered STN: 06 Oct 2006

AB **Neg. electrodes** and non-aqueous secondary **batteries** that comprise the **neg. electrodes** are disclosed. The **electrode** comprises a **current collector**; and a mixture on the **current collector**, the mixture comprising a **neg. electrode** active material, a conductive material, and a binder. The active material has the overall composition: AM1qM21-qOy; in which (1) A is Lix or Lix-rGr, in which G is selected from Na, K, Cs, Be, Mg, Ca, Sr, Ba, and mixts. thereof, in which G and M' are different; (2) $0 \leq x \leq 3$; $0 < y \leq 3$; $0 \leq q \leq 1$; and $0 \leq r \leq 3$; and (3) either M1 is selected from Sn, Mg, and mixts. thereof, and M2 is selected from V, Ti, Nb, Mn, Cr, Sb, Mo, Zr, W, and mixts. thereof; or M1 is selected from Y, Co, and mixts. of two or more of Y, Co, Sn, and Mg, and M2 is selected from Ti, Nb, Mn, Cr, Sb, Mo, Zr, W, and mixts. thereof.

IT **4427-96-7**, Vinyl ethylene carbonate
(**anode** for nonaq. secondary **battery**)

RN 4427-96-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **anode** nonaq secondary **battery**

IT **Battery anodes**
**Battery** electrolytes
**Secondary batteries**
(**anode** for nonaq. secondary **battery**)

IT 12031-65-1, Lithium nickel oxide (LiNiO2) 12031-82-2, Lithium titanium oxide (Li2TiO3) 12031-83-3, Lithium zirconium oxide li2zro3 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2)
(**anode** for nonaq. secondary **battery**)

IT 7440-44-0DP, Carbon, lithium intercalation compound 34196-36-6DP, Titanium oxide (TiO3), lithium intercalation compound 39300-70-4P, Lithium nickel oxide 906796-45-0P, Lithium tin titanium oxide 910794-69-3DP, Tin titanium oxide (Sn0.1Ti0.9O3), lithium intercalation compound 910794-70-6DP, Cobalt titanium oxide (Co0.1Ti0.9O3), lithium intercalation compound 910794-71-7DP, Titanium yttrium oxide (Ti0.9Y0.1O3), lithium intercalation compound 910794-72-8DP, Magnesium titanium oxide (Mg0.1Ti0.9O3), lithium intercalation compound 910794-73-9DP, Magnesium titanium oxide (Mg0.2Ti0.8O3), lithium intercalation compound 910794-74-0DP, Tin vanadium oxide (Sn0.2V0.8O3), lithium intercalation compound 910794-75-1DP, Magnesium vanadium oxide (Mg0.1V0.9O3), lithium intercalation compound 910794-76-2DP, Niobium tin oxide (Nb0.6Sn0.4O3), lithium intercalation compound 910794-77-3DP,

Manganese tin oxide (Mn0.6Sn0.4O3), lithium intercalation compound 910794-78-4DP, Chromium tin oxide (Cr0.6Sn0.4O3), lithium intercalation compound 910794-79-5P, Lithium tin titanium oxide (Li2Sn0.1Ti0.9O3) 910794-80-8P, Cobalt lithium titanium oxide (Co0.1Li2Ti0.9O3) 910794-81-9P, Lithium titanium yttrium oxide (Li2Ti0.9Y0.1O3) 910794-82-0P, Lithium magnesium titanium oxide (Li2Mg0.1Ti0.9O3) 910794-83-1P, Lithium magnesium titanium oxide (Li2Mg0.2Ti0.8O3) 910794-84-2P, Lithium tin zirconium oxide (Li2Sn0.2Zr0.8O3) 910794-85-3P, Cobalt lithium zirconium oxide (Co0.2Li2Zr0.8O3) 910794-86-4P, Lithium yttrium zirconium oxide (Li2Y0.05Zr0.95O3) 910794-87-5P, Lithium magnesium zirconium oxide (Li2Mg0.1Zr0.9O3) 910794-88-6P, Cobalt lithium niobium oxide (Co0.4Li2Nb0.6O3) 910794-89-7P, Cobalt lithium molybdenum oxide (Co0.4Li2Mo0.6O4) 910794-90-0P, Cobalt lithium tungsten oxide (Co0.4Li2W0.6O4) 910794-91-1P, Cobalt lithium potassium tungsten oxide (Co0.1Li1.67K0.33W0.9O4) 910794-92-2P, Cobalt lithium magnesium tungsten oxide (Co0.1Li1.67Mg0.33W0.9O4) 910795-48-1P, Antimony tin oxide (Sb0.6Sn0.4O3)
(**anode** for nonaq. secondary **battery**)

IT 872-36-6, Vinylene carbonate 1120-71-4, 1,3-Propanesultone 4427-92-3, Phenyl ethylene carbonate **4427-96-7**, Vinyl ethylene carbonate
(**anode** for nonaq. secondary **battery**)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 6 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:593741 HCAPLUS Full-text
DOCUMENT NUMBER: 145:106745
TITLE: Method for fabricating flexible packaged lithium ion **battery** with improved safety and no deformation
INVENTOR(S): Ma, Zhonglong; Lu, Xin; Wang, Yulai; Li, Huifang; Zhang, Lina
PATENT ASSIGNEE(S): Tianjin Lishen Battery Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 7 pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| CN 1787274 | A | 20060614 | CN 2005-10015493 | 20051018 |
| PRIORITY APPLN. INFO.: | | | CN 2005-10015493 | 20051018 |

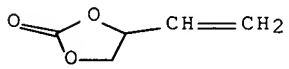
ED Entered STN: 21 Jun 2006

AB The title **battery** includes an aluminum foil with a pos. ear and a coating containing a pos. **electrode** active material, a **copper foil** with a neg. ear and a coating containing a neg. **electrode** active material, and an electrolyte containing propylene sulfite 2% and 4-vinyl-1,3-dioxolan-2-one 1%, wherein the thickness of the pos. or neg. ear is greater than that of the aluminum or **copper foil**. The **battery** also includes a pad (having a thickness and an expansion coefficient similar to the neg. ear) disposed near to the neg. ear on the **copper foil**. The **battery** has improved safety and no deformation.

IT **4427-96-7**, 4-Vinyl-1,3-dioxolan-2-one **7440-50-8**, **Copper**, uses
(method for fabricating flexible packaged lithium ion

**battery** with improved safety and no deformation)

RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST flexible packaged lithium ion **battery copper** aluminum safety
IT **Secondary batteries**
(lithium; method for fabricating flexible packaged lithium ion **battery** with improved safety and no deformation)
IT **Battery electrodes**
Safety
(method for fabricating flexible packaged lithium ion **battery** with improved safety and no deformation)
IT 1469-73-4, Propylene sulfite **4427-96-7**, 4-Vinyl-1,3-dioxolan-2-one 7429-90-5, Aluminum, uses **7440-50-8**, **Copper**, uses
(method for fabricating flexible packaged lithium ion **battery** with improved safety and no deformation)

L50 ANSWER 7 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:216213 HCAPLUS Full-text
DOCUMENT NUMBER: 142:264431
TITLE: Secondary nonaqueous-electrolyte **battery**
INVENTOR(S): Saisho, Keiji; Yoshimura, Seiji
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| JP 2005063673 | A | 20050310 | JP 2003-206877 | 20030808 |
| PRIORITY APPLN. INFO.: | | | JP 2003-206877 | 20030808 |

ED Entered STN: 11 Mar 2005
AB The claimed **battery** is equipped with (1) an electrolyte solution containing a Li-consuming substance for generating a Li-containing compound by reaction with Li after reduction decomposition, (2) a **cathode** subcomponent containing Li2TiO3 where a part of Ti is substituted with a metal, and (3) a **Cu anode collector**. The Li-consuming substance may be selected from vinylene carbonate

and vinyl ethylene carbonate. The **battery** is prevented from deterioration caused by overdischarging.

IT **7440-50-8, Copper,** uses
(**anode collector;** nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

RN 7440-50-8 HCAPLUS

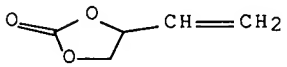
CN Copper (CA INDEX NAME)

Cu

IT **4427-96-7,** Vinyl ethylene carbonate
(electrolyte solution containing; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

RN 4427-96-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **cathode** additive substituted lithium titanate secondary **battery;** nonaq electrolyte vinylene carbonate lithium **battery**

IT **Secondary batteries**
(lithium; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT **Battery cathodes**
**Battery** electrolytes
(nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT **7440-50-8, Copper,** uses
(**anode collector;** nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT 846022-08-0, Iron lithium titanium oxide ((Fe,Ti)Li2O3) 846022-09-1, Cobalt lithium titanium oxide ((Co,Ti)Li2O3) 846022-10-4, Lithium manganese titanium oxide (Li2(Mn,Ti)O3) 846022-12-6, Lithium titanium vanadium oxide (Li2(Ti,V)O3) 846022-13-7, Lithium nickel titanium oxide (Li2(Ni,Ti)O3) 846022-14-8, Lithium magnesium titanium oxide (Li2(Mg,Ti)O3)
(**cathode** additive; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT 52627-24-4, Cobalt lithium oxide
(**cathode;** nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT 872-36-6, Vinylene carbonate **4427-96-7,** Vinyl ethylene

carbonate
(electrolyte solution containing; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
(electrolyte solvent; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

IT 21324-40-3, Lithium hexafluorophosphate
(electrolyte; nonaq. **battery** containing metal-substituted lithium titanate and decomposable carbonate compound)

L50 ANSWER 8 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:78054 HCAPLUS Full-text
DOCUMENT NUMBER: 142:159575
TITLE: Method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes
INVENTOR(S): Yoon, Sang Young; Ph, Bookeun; Amine, Khalil
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 12 pp., Cont.-in-part of U.S. Ser. No. 104,352.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 13
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2005019656 | A1 | 20050127 | US 2004-496231 | 20040520 |
| US 2003180624 | A1 | 20030925 | US 2002-104352 | 20020322 |
| WO 2003083970 | A1 | 20031009 | WO 2003-US2127 | 20030122 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| WO 2003083971 | A1 | 20031009 | WO 2003-US2128 | 20030122 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| WO 2003083974 | A1 | 20031009 | WO 2003-US8783 | 20030320 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, | | | | |

LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG

| | | | | |
|---|---|---|---|---|
| US 2005106470 | A1 | 20050519 | US 2004-962125 | 20041007 |
| US 2007065728 | A1 | 20070322 | US 2006-346087 | 20060202 |

PRIORITY APPLN. INFO.:

| | | |
|---|---|---|
| US 2002-104352 | A2 | 20020322 |
| WO 2003-US2127 | A | 20030122 |
| WO 2003-US2128 | A | 20030122 |
| US 2003-443892P | P | 20030130 |
| US 2003-446848P | P | 20030211 |
| US 2003-451065P | P | 20030226 |
| WO 2003-US8783 | W | 20030320 |
| US 2002-72739 | B2 | 20020208 |
| US 2002-167940 | A | 20020612 |
| US 2004-542017P | P | 20040204 |
| US 2004-543898P | P | 20040211 |
| US 2004-543951P | P | 20040211 |
| US 2004-810019 | A2 | 20040325 |
| US 2004-810080 | A2 | 20040325 |
| US 2004-810081 | A2 | 20040325 |
| US 2004-563848P | P | 20040419 |
| US 2004-563849P | P | 20040419 |
| US 2004-563850P | P | 20040419 |
| US 2004-563852P | P | 20040419 |
| US 2004-565211P | P | 20040422 |
| US 2004-496231 | A2 | 20040520 |
| US 2004-601452P | P | 20040813 |
| US 2004-962125 | A2 | 20041007 |
| US 2004-971912 | A2 | 20041021 |
| US 2005-53338 | A2 | 20050208 |

| | | |
|---|---|---|
| US 2005-56866 | A2 | 20050210 |
| US 2005-56867 | A2 | 20050210 |
| US 2005-56868 | A2 | 20050210 |
| US 2005-56869 | A2 | 20050210 |
| US 2005-668878P | P | 20050405 |
| US 2005-211970 | A2 | 20050824 |
| US 2005-271473 | A2 | 20051110 |
| US 2005-272261 | A2 | 20051110 |

ED Entered STN: 28 Jan 2005

AB Disclosed is a method for manufacturing **electrodes** for electrochem. devices such as **batteries** and capacitors in which a viscous polysiloxane polymer electrolyte is incorporated into the slurry of materials forming the **electrode**. The optional addition of protective additives to the slurry is also disclosed. A follow-on vacuum impregnation step is disclosed to further improve penetration and wetting by the electrolyte.

IT **7440-50-8, Copper,** uses
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

RN 7440-50-8 HCAPLUS

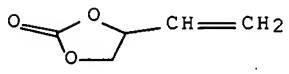
CN Copper (CA INDEX NAME)

Cu

IT **4427-96-7,** Vinyl ethylene carbonate
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

RN 4427-96-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IC ICM H01M004-04
ICS H01M004-62; H01M004-52

INCL 429217000; 141001100; 429231950; 429231600; 429231300; 429231100; 429223000; 029623500; 029623200

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

ST **electrode** composite **battery** liq polymer electrolyte

IT Natural rubber, uses
Nitrile rubber, uses
Styrene-butadiene rubber, uses
(binder; method for fabricating composite **electrodes** for

**batteries** using liquid polymer electrolytes)
IT Crystal whiskers
(graphite; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Carbon fibers, uses
(graphite; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Polymers, uses
(liquid, saturated; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT **Secondary batteries**
(lithium; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Capacitors
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Intermetallic compounds
Polyoxyalkylenes, uses
Polysiloxanes, uses
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Carbon black, uses
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Fluoropolymers, uses
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Metallic fibers
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Polysiloxanes, uses
(polyoxyalkylene-, graft; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Polyoxyalkylenes, uses
(polysiloxane-, graft; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT Tin alloy, base
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT 78-79-5, Isoprene, uses 10344-93-1, Acrylate, uses 24937-79-9, Pvdf
(binder; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)
IT 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses **7440-50-8**, **Copper**, uses 7782-42-5, Graphite, uses 12022-46-7, Iron lithium oxide (FeLiO2) 12031-65-1, Lithium nickel oxide (LiNiO2) 12031-95-7, Lithium titanium oxide (Li4Ti5O12) 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2) 15365-14-7, Iron lithium phosphate felipo4 25322-68-3D, Polyethylene oxide, reaction product with siloxanes 90076-65-6, Litfsi 128975-24-6, Lithium manganese nickel oxide limn0.5ni0.5o2 177997-13-6, Aluminum cobalt lithium nickel oxide 180997-14-2, Cobalt lithium magnesium nickel oxide 182442-97-3, Cobalt lithium nickel zinc oxide 244304-20-9, Cobalt lithium nickel titanium oxide 244761-29-3, Lithium bis(oxalato)borate 609349-41-9, Cobalt lithium manganese nickel oxide (Co0.3LiMn0.3Ni0.3O2) 609349-42-0, Lithium manganese nickel oxide (LiMn1.5NiO4) 609349-43-1, Cobalt lithium manganese oxide

(CoLiMn1.5O4) 609349-44-2, Iron lithium manganese oxide (FeLiMn1.5O4)
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 420-12-2, Ethylene sulfide 823-31-4, Ethyl Ethylene phosphate 872-36-6, Vinylene carbonate **4427-96-7**, Vinyl ethylene carbonate 7446-09-5, Sulfur dioxide, uses
(method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

IT 9003-18-3
(nitrile rubber, binder; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

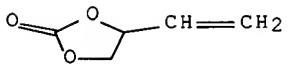
IT 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 109-99-9, Thf, uses 127-19-5, Dimethyl acetamide 872-50-4, n-Methylpyrrolidone, uses 7732-18-5, Water, uses
(solvent; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

IT 9003-55-8
(styrene-butadiene rubber, binder; method for fabricating composite **electrodes** for **batteries** using liquid polymer electrolytes)

L50 ANSWER 9 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:913331 HCAPLUS Full-text
DOCUMENT NUMBER: 142:138185
TITLE: Effect of Morphology and Current Density on the Electrochemical Behavior of Graphite **Electrodes** in PC-Based Electrolyte Containing VEC Additive
AUTHOR(S): Hu, Yongsheng; Kong, Weihe; Wang, Zhaoxiang; Li, Hong; Huang, Xuejie; Chen, Liquan
CORPORATE SOURCE: Laboratory for Solid State Ionics, Institute of Physics, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China
SOURCE: Electrochemical and Solid-State Letters (2004), 7(11), A442-A446
CODEN: ESLEF6; ISSN: 1099-0062
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 01 Nov 2004
AB The effect of graphite morphol. and charge/discharge condition on the electrochem. behavior of the graphite **electrodes** were studied in propylene carbonate-based electrolyte containing vinyl ethylene carbonate (VEC) as a film-forming additive. The graphite particles with different morphologies including synthetic graphite flakes and sphere-shaped graphite particles, i.e., mesocarbon microbeads (MCMB), exhibit the large difference in electrochem. behavior. The cointercalation of solvents and solvated Li+ ions into MCMB was suppressed significantly using high charge/discharge c.d., which improves the electrochem. performance of the MCMB **electrode**.

IT **4427-96-7**, Vinyl ethylene carbonate
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)

RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IT **7440-50-8, Copper,** uses
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 75, 76
ST morphol carbon graphite **electrode** current density electrochem carbonate electrolyte
IT **Battery electrodes**
Current density
Intercalation
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT Fluoropolymers, uses
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT **Electrode**-electrolyte interface
(film formed during cycling; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT **Secondary batteries**
(lithium; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT Crystal morphology
(of graphite, effect on **electrode**-electrolyte interface layer; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT Electric capacitance
(voltage vs. capacity for charge/discharge of assembled **batteries**; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT 108-32-7, Propylene carbonate **4427-96-7,** Vinyl ethylene carbonate 24937-79-9, PVDF 132843-44-8, Lithium bis(perfluoroethylsulfonyl)imide
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT 7439-93-2, Lithium, uses **7440-50-8, Copper,** uses
(effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
IT 7440-44-0, Carbon, uses
(mesocarbon microbeads; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)

IT 605664-53-7, Timrex SLP 30
(synthetic Graphite flakes and spheres; effect of morphol. and c.d. on electrochem. behavior of graphite **electrodes** in PC-based electrolyte containing VEC additive)
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

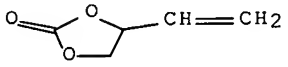
L50 ANSWER 10 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:802392 HCAPLUS Full-text
DOCUMENT NUMBER: 141:280433
TITLE: Nonaqueous electrolyte secondary **battery**
INVENTOR(S): Kida, Yoshinori; Yanagida, Katsunori; Yanai, Atsushi; Ikemachi, Takaaki; Nohma, Toshiyuki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 6 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2004191636 | A1 | 20040930 | US 2004-809842 | 20040326 |
| JP 2004296389 | A | 20041021 | JP 2003-90505 | 20030328 |
| PRIORITY APPLN. INFO.: | | | JP 2003-90505 A | 20030328 |

ED Entered STN: 01 Oct 2004
AB A nonaq. electrolyte secondary **battery** includes a pos. **electrode** containing a pos. **electrode** active material, a neg. **electrode** containing a carbon material as a neg. **electrode** active material, and a nonaq. electrolyte containing a solvent and a solute wherein sulfolane is included in the nonaq. electrolyte as a solvent and vinyl ethylene carbonate and vinylene carbonate or a derivative of the vinylene carbonate are added to the nonaq. electrolyte.
IT **7440-50-8, Copper**, uses
(nonaq. electrolyte secondary **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **4427-96-7**, Vinyl ethylene carbonate
(nonaq. electrolyte secondary **battery**)
RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-58

INCL 429330000; 429340000; 429329000; 429231800
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST nonaq electrolyte secondary **battery**
IT **Battery** electrolytes
Pitch
**Secondary batteries**
(nonaq. electrolyte secondary **battery**)
IT Carbonaceous materials (technological products)
(nonaq. electrolyte secondary **battery**)
IT Styrene-butadiene rubber, uses
(nonaq. electrolyte secondary **battery**)
IT 96-48-0, γ-Butyrolactone 126-33-0, Sulfolane **7440-50-8**, **Copper**, uses 7782-42-5, Graphite, uses 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate
(nonaq. electrolyte secondary **battery**)
IT 78-42-2, Trioctyl phosphate 872-36-6, Vinylene carbonate 872-36-6D, Vinylene carbonate, derivative **4427-96-7**, Vinyl ethylene carbonate 9000-11-7, Cmc
(nonaq. electrolyte secondary **battery**)
IT 9003-55-8
(styrene-butadiene rubber; nonaq. electrolyte secondary **battery**)

L50 ANSWER 11 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:493176 HCAPLUS Full-text
DOCUMENT NUMBER: 141:26166
TITLE: Secondary **battery**
INVENTOR(S): Kawase, Kenichi; Takada, Tomoo; Miyaki, Yukio
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

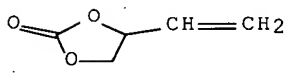
| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| JP 2004171877 | A | 20040617 | JP 2002-335055 | 20021119 |
| US 2004151987 | A1 | 20040805 | US 2003-713969 | 20031114 |
| | | | <-- | |
| KR 2004044367 | A | 20040528 | KR 2003-81956 | 20031119 |
| CN 1523701 | A | 20040825 | CN 2003-10124931 | 20031119 |

PRIORITY APPLN. INFO.: JP 2002-335055 A 20021119

ED Entered STN: 18 Jun 2004
AB The **battery** has a **cathode**, an **anode**, and an electrolyte solution; where the **anode** has a **collector** and an active mass layer alloying with the **collector** at ≥1 part of the interface between the **collector** and established on the **collector**; and the electrolyte solution contains an electrolyte salt and an unsatd. bond containing **cyclic carbonate**.
IT **7440-21-3**, **Silicon**, uses
(amorphous; secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IT **4427-96-7**, Vinyl ethylene carbonate **7440-50-8**, **Copper**, uses **12645-62-4**
(secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)
RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 12645-62-4 HCAPLUS
CN Copper alloy, nonbase, Cu,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Cu | 7440-50-8 |
| Si | 7440-21-3 |

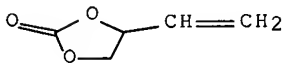
IC ICM H01M010-40
ICS H01M002-02; H01M004-02; H01M004-38
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST secondary **battery anode** active mass **collector** alloy interface; **battery** electrolyte solvent unsatd bond contg **cyclic carbonate**
IT **Battery anodes**
**Secondary batteries**
(secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)
IT **7440-21-3**, **Silicon**, uses
(amorphous; secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)
IT 12190-79-3, Cobalt lithium oxide (CoLiO2)
(**cathode**; secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 872-36-6, Vinylene carbonate **4427-96-7**, Vinyl ethylene carbonate 7440-31-5D, Tin, gold plated **7440-50-8**, **Copper**, uses 7782-42-5, Graphite, uses **12645-62-4** 12668-36-9 21324-40-3, Lithium hexafluorophosphate
(secondary **batteries** having alloy interfaces in **anodes** and unsatd. bond containing **cyclic carbonates** in electrolyte solns.)

L50 ANSWER 12 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:493175 HCAPLUS Full-text
DOCUMENT NUMBER: 141:26165
TITLE: Secondary **battery**
INVENTOR(S): Kawase, Kenichi; Takada, Tomoo; Miyaki, Yukio
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| JP 2004171876 | A | 20040617 | JP 2002-335054 | 20021119 |
| PRIORITY APPLN. INFO.: | | | JP 2002-335054 | 20021119 |

ED Entered STN: 18 Jun 2004
AB The **battery** has a **cathode**, an **anode**, and an electrolyte solution; where the **anode** has a **collector** and an active mass layer alloying with the **collector** at ≥1 part of the interface between the **collector** and established on the **collector**; and the electrolyte solution contains an electrolyte salt and a **cyclic carbonate** and/or its deriv(s).
IT **4427-96-7**, Vinyl ethylene carbonate **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses **12645-62-4**
(secondary **batteries** containing alloy interfaces in **anodes** and **cyclic carbonates** in electrolyte solns.)
RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

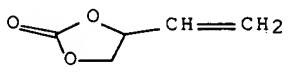
RN 12645-62-4 HCAPLUS
CN Copper alloy, nonbase, Cu,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Cu | 7440-50-8 |
| Si | 7440-21-3 |

IC ICM H01M010-40
ICS H01M002-02; H01M004-02; H01M004-38; H01M004-66
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST secondary **battery anode** active mass **collector** alloy interface; **battery** electrolyte solvent **cyclic carbonate** deriv
IT **Battery anodes**
**Secondary batteries**
(secondary **batteries** containing alloy interfaces in **anodes** and **cyclic carbonates** in electrolyte solns.)
IT 12190-79-3, Cobalt lithium oxide (CoLiO2)
(**cathode**; secondary **batteries** containing alloy interfaces in **anodes** and **cyclic carbonates** in electrolyte solns.)
IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 872-36-6, Vinylene carbonate **4427-96-7**, Vinyl ethylene carbonate **7440-21-3**, **Silicon**, uses 7440-31-5D, Tin, gold plated **7440-50-8**, **Copper**, uses **12645-62-4** 12668-36-9 21324-40-3, Lithium hexafluorophosphate
(secondary **batteries** containing alloy interfaces in **anodes** and **cyclic carbonates** in electrolyte solns.)

L50 ANSWER 13 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:45248 HCAPLUS Full-text
DOCUMENT NUMBER: 140:289889
TITLE: Experimental and theoretical studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**
AUTHOR(S): Hu, Yongsheng; Kong, Weihe; Li, Hong; Huang, Xuejie; Chen, Liquan
CORPORATE SOURCE: Institute of Physics, Laboratory for Solid State Ionics, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China
SOURCE: Electrochemistry Communications (2004), 6(2), 126-131
CODEN: ECCMF9; ISSN: 1388-2481
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal

LANGUAGE: English
ED Entered STN: 19 Jan 2004
AB Vinyl ethylene carbonate (VEC) was studied as an electrolyte additive for use in lithium ion **batteries**. Even in small additive amts. (5 volume%) VEC was capable of preventing propylene carbonate (PC) co-intercalation into graphite. The formation of a stable passivating film on the graphite surface is believed to be the reason for the improved cell performance. The passivating film resulting from the reductive decomposition of VEC on the graphite surface was comprehensively studied by FTIR and XPS as well as the d. functional theory (DFT) calcns.
IT **4427-96-7**, Vinyl ethylene carbonate
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IT **7440-50-8**, **Copper**, uses
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76
ST redn vinyl ethylene carbonate graphite **anode** lithium ion **battery**; solid electrolyte interface VEC decompn lithium intercalation passivation inhibition
IT IR spectroscopy
(Fourier-transform, of SEI layer after discharge; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
IT **Electrode**-electrolyte interface
(SEI layer; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
IT Intercalation
(co-, inhibition of; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
IT Fluoropolymers, uses
(composite **anode** with graphite; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
IT Electric potential
(discharge-time curve for assembled cells; exptl. and theor.

studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT Carbonates, properties
(esters and lithium salts, VEC-lithium salt decomposition products in SEI; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT **Battery anodes**
**Battery** electrolytes
Electric capacitance
Intercalation
Passivation
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT Electric current-potential relationship
(for assembled cells; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT **Secondary batteries**
(lithium; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT Density functional theory
(modeling VEC decomposition reaction; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT X-ray photoelectron spectra
(of SEI layer after discharge; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT Decomposition
(of VEC; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 132843-44-8, Lithium bis(perfluoroethylsulfonyl)imide
(LiBETI; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 605664-53-7, Timrex SLP 30
(composite **anode** with PVDF; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 24937-79-9, PVDF
(composite **anode** with graphite; exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 108-32-7, Propylene carbonate
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT **4427-96-7**, Vinyl ethylene carbonate
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 7782-42-5, Graphite, uses
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)

IT 7439-93-2, Lithium, uses **7440-50-8, Copper**, uses
(exptl. and theor. studies on reduction mechanism of vinyl ethylene carbonate on graphite **anode** for lithium ion **batteries**)
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

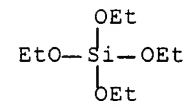
L50 ANSWER 14 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:688502 HCAPLUS Full-text
DOCUMENT NUMBER: 137:219521
TITLE: Alkali ion conducting polymer electrolytes for use in high energy **batteries**
INVENTOR(S): Spiegel, Ella F.; Sammells, Anthony F.; Adamic, Kresimir
PATENT ASSIGNEE(S): Eltron Research, Inc., USA
SOURCE: U.S., 17 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 6447952 | B1 | 20020910 | US 2000-587439 | | 20000605 |
| PRIORITY APPLN. INFO.: | | | US 1999-137870P | P | 19990607 |

ED Entered STN: 11 Sep 2002
AB This invention provides alkali ion conducting polymer electrolytes with high ionic conductivity and elastomeric properties suitable for use in high energy **batteries**. The polymer electrolytes are **cyclic carbonate**-containing polysiloxanes that can be modified with a cross-linker or chain extender, and an alkali metal ion-containing material dissolved in the carbonate-containing polysiloxane. The **cyclic carbonate**-containing polysiloxanes may be prepared by reacting derivatized polysiloxanes with chain extending and/or crosslinking agents. The invention also provides **batteries** prepared by contacting an alkali metal **anode** with an alkali metal intercalating **cathode** and an alkali ion-conducting polymer electrolyte. As one example, polymers prepared from poly {3[2,3-(carbonyldioxy)propoxy]propyl}methylsiloxane, a polysiloxane with **cyclic carbonate** side chains, have shown promising results for **battery** applications. This polymer was crosslinked with methyltriacetoxy silane and incorporates lithium trifluoromethanesulfonate into the polymer matrix as the ion conductor. Polymers were prepared using various solvent systems and temps. in order to produce a polymer film with the desired properties for this application. Each polymer made from the precursor poly {3[2,3-(carbonyldioxy)propoxy]propyl}methyl siloxane exhibits a glass transition temperature (Tg) in the range of -100° to -70° and ionic conductivity of 6.5+10-5 at 25° and 5.3+10-4 at 60° which indicates that this material has distinct possibilities in lithium **battery** applications. Materials are flexible and readily adhere to the **electrode** surface. Polymers are synthesized by initially forming alkyl chains which include an ester carbonic acid group. The ester carbonic acid contains the ether oxygen within the single phase polymer matrix which facilitates the ionic dissociation of lithium salts. Ester carbonic acids groups are formed by the transesterification of alkyl diols such as 3-(allyloxy)-1,2-propanediol and 1,2 hexanediol with di-Et carbonate. This reaction produces ester carbonic acids with reactive end groups such as alkyls and alkanes which can then be further reacted to form dihalide end groups. Reactive groups on the ester carbonic acid are then

reacted with various polymethyl siloxanes which serve as the polymer backbone for single phase elastomeric polymers which readily dissolve lithium salts.

IT **78-10-4**, Tetraethoxysilane
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)
RN 78-10-4 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester (CA INDEX NAME)



IT **7440-50-8, Copper**, uses
(substrate; alkali ion conducting polymer electrolytes for use in high energy **batteries**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-58
INCL 429218100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **battery** polymer electrolyte alkali ion conducting; **cyclic carbonate** contg polysiloxane **battery**
IT **Battery** electrolytes
Conducting polymers
Glass transition temperature
Ionic conductivity
Polymer electrolytes
**Secondary batteries**
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)
IT Polysiloxanes, uses
(**cyclic carbonate**-containing; alkali ion conducting polymer electrolytes for use in high energy **batteries**)
IT 826-29-9P
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)
IT 49718-23-2DP, Methylsilanediol homopolymer, hydroxilation products with 4-(allyloxymethyl)-2-oxo-1,3-dioxolane, reaction products with diacetoxymethylvinylsilane 455945-64-9P, P 1303
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)
IT 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole 7439-93-2, Lithium, uses 12031-65-1, Lithium nickel oxide linio2 12037-42-2, Vanadium oxide v6o13 12039-13-3, Titanium sulfide tis2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 39457-42-6, Lithium manganese oxide 173525-03-6, Lithium manganese

sodium oxide 181183-66-4, **Copper** silver vanadium oxide
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)

IT 455945-81-0P, P 1401 455945-87-6P, P 1302 455945-91-2P, P 1801
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)

IT **78-10-4**, Tetraethoxysilane 2944-70-9, Diacetoxymethylvinylsilane 4253-34-3, Methyltriacetoxysilane 5507-44-8, Vinylmethyldiethoxysilane
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)

IT 7440-02-0, Nickel, uses
(alkali ion conducting polymer electrolytes for use in high energy **batteries**)

IT 9004-73-3DP, Polymethylhydrogen siloxane, hydroxilation products with 4-(allyloxymethyl)-2-oxo-1,3-dioxolane, reaction products with diacetoxymethylvinylsilane, polymers with methyltriacetoxysilane
(crosslinked; alkali ion conducting polymer electrolytes for use in high energy **batteries**)

IT **7440-50-8**, **Copper**, uses
(substrate; alkali ion conducting polymer electrolytes for use in high energy **batteries**)

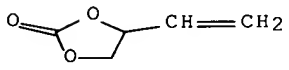
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 15 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:539996 HCAPLUS Full-text
DOCUMENT NUMBER: 137:111684
TITLE: Nonaqueous electrolytes and lithium secondary **battery** employing electrolytes thereof
INVENTOR(S): Yasukawa, Eiki; Shima, Kunihisa; Kominato, Asao; Ishigaki, Ken-Ichi; Wang, Xianming; Fujii, Takashi; Kotato, Minoru; Shigematsu, Yasuyuki; Fuse, Tooru; Satou, Hideharu
PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan
SOURCE: PCT Int. Appl., 67 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2002056408 | A1 | 20020718 | WO 2001-JP11630 | 20011228 |
| W: AE, AG, AL, AU, BA, BB, BG, BR, BZ, CA, CN, CO, CR, CU, CZ, DM, DZ, EC, EE, GD, GE, HR, HU, ID, IL, IN, IS, KR, LC, LK, LR, LT, LV, MA, MG, MK, MN, MX, NO, NZ, OM, PH, PL, RO, SG, SI, SK, TN, TT, UA, US, UZ, VN, YU, ZA, ZM, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| JP 2002203596 | A | 20020719 | JP 2001-80 | 20010104 |
| JP 2002203597 | A | 20020719 | JP 2001-81 | 20010104 |
| JP 2003173819 | A | 20030620 | JP 2001-372550 | 20011206 |
| JP 2003187865 | A | 20030704 | JP 2001-388034 | 20011220 |
| JP 3929303 | B2 | 20070613 | | |

| | | | | |
|---|---|---|---|---|
| JP 2003187866 | A | 20030704 | JP 2001-388035 | 20011220 |
| JP 3929304 | B2 | 20070613 | | |
| AU 2002225374 | A1 | 20020724 | AU 2002-225374 | 20011228 |
| EP 1357628 | A1 | 20031029 | EP 2001-995034 | 20011228 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| JP 2003234127 | A | 20030822 | JP 2002-331717 | 20021115 |
| US 2006172201 | A1 | 20060803 | US 2003-606706 | 20030625 |
| PRIORITY APPLN. INFO.: | | | JP 2001-80 | A 20010104 |
| | | | JP 2001-81 | A 20010104 |
| | | | JP 2001-372549 | A 20011206 |
| | | | JP 2001-372550 | A 20011206 |
| | | | JP 2001-388034 | A 20011220 |
| | | | JP 2001-388035 | A 20011220 |
| | | | WO 2001-JP11630 | W 20011228 |

OTHER SOURCE(S): MARPAT 137:111684
ED Entered STN: 19 Jul 2002
AB Nonaq. electrolytic liqs. for lithium secondary **batteries** which have flame retardancy (self-extinguishing characteristics) or incombustibility (no flash point), have a high conductivity and are electrochem. stable. One of the nonaq. electrolytic liqs. comprises a nonaq. solvent comprising as an essential ingredient at least one phosphate (a) selected among chain phosphoric esters (a1) and cyclic phosphoric esters (a2). The nonaq. solvent may further contain a cyclic carboxylic ester (b1) and a cyclic carbonic ester (b2). Another nonaq. electrolytic liquid comprises the nonaq. solvent and incorporated therein at least either a vinylene carbonate compound (c1) or a **vinylethylene carbonate** compound (c2) and one or more compds. selected from the group consisting of cyclic amide compds. (d1), cyclic carbamate compds. (d2), and cyclic hetero-compds. (d3).
IT **4427-96-7, Vinylethylene carbonate**
(additive, in conductivity electrolyte solvent; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
RN 4427-96-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-ethenyl- (CA INDEX NAME)



IT **7440-50-8, Copper**, uses
(**electrodes**; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M010-40
ICS H01M004-58; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 72
ST flame retardancy cond electrochem stability electrolyte lithium secondary **battery**; phosphate phosphoric ester chain cyclic electrolytic solvent
IT Phosphates, uses
(esters, for solvents for electrolytes; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT Fireproofing agents
(flame retardation; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT Lactams
(for conductivity electrolyte solvent; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT Electric conductivity
(high in, in electrolyte; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT **Secondary batteries**
(lithium, nonaq. electrolyte for; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT Electrolytes
(nonaq., solvents for; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT Electrochemistry
(stability in; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT 872-36-6, Vinylene carbonate **4427-96-7**, **Vinylethylene carbonate**
(additive, in conductivity electrolyte solvent; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT 7440-02-0, Nickel, uses **7440-50-8**, **Copper**, uses 12597-68-1, Stainless steel, uses
(**electrodes**; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT 7439-93-2, Lithium, uses
(secondary **batteries**; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT 21324-40-3
(solute in electrolyte solution; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-29-2, γ-Valerolactone 502-44-3, ε-Caprolactone 512-56-1, Trimethyl phosphate 823-31-4 867-17-4, Diethyl methyl phosphate 2196-04-5, Ethylene methyl phosphate 10463-05-5, Dimethyl ethyl phosphate 10463-06-6 59259-32-4, Dimethyl propyl phosphate
(solvent, for electrolyte; nonaq. electrolytes and lithium secondary **battery** employing electrolytes thereof)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 16 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1990:220375 HCAPLUS Full-text
DOCUMENT NUMBER: 112:220375
TITLE: Nonaqueous lithium alloy **battery**

INVENTOR(S): Furukawa, Nobuhiro; Yoshimura, Seiji; Takahashi, Masatoshi
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 48 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 349675 | A2 | 19900110 | EP 1988-119035 | 19881115 |
| EP 349675 | A3 | 19900509 | | |
| EP 349675 | B1 | 19970416 | | |
| R: CH, DE, FR, GB, LI, NL, SE | | | | |
| JP 02015566 | A | 19900119 | JP 1988-165724 | 19880701 |
| JP 06073303 | B | 19940914 | | |
| JP 02015567 | A | 19900119 | JP 1988-165725 | 19880701 |
| JP 07015821 | B | 19950222 | | |
| JP 02015568 | A | 19900119 | JP 1988-165726 | 19880701 |
| JP 2698103 | B2 | 19980119 | | |
| CA 1308778 | C | 19921013 | CA 1988-582548 | 19881108 |
| US 5112704 | A | 19920512 | US 1990-492267 | 19900228 |
| CA 1317631 | C2 | 19930511 | CA 1992-616388 | 19920526 |
| CA 1317632 | C2 | 19930511 | CA 1992-616389 | 19920526 |
| CA 1317633 | C2 | 19930511 | CA 1992-616390 | 19920526 |

PRIORITY APPLN. INFO.:

| | | |
|---|---|---|
| JP 1988-165724 | A | 19880701 |
| JP 1988-165725 | A | 19880701 |
| JP 1988-165726 | A | 19880701 |
| US 1988-267591 | B1 | 19881107 |
| CA 1988-582548 | A3 | 19881108 |

ED Entered STN: 09 Jun 1990

AB The **battery** includes an electrolyte of LiF3CSO3 and organic solvent mixture of ≥2 high b.p. solvents and including ≥1 **cyclic carbonate**. The solvent mixture comprises ethylene carbonate (EC), butylene carbonate, and DME; EC, γ-butyrolactone, and DME; or propylene carbonate, sulfolane, and THF. The **battery cathode** is selected from oxides, sulfides, and halides. LiF3CSO3 is heated, dried, and dehydrated in a vacuum at 80-150°. The electrolyte contains an inhibitor for inhibiting reaction between the **battery** can and the electrolyte. The inhibitor is selected from LiNO3, (EtO)3PO, (n-BuO)3PO, N,N,N',N'-tetramethyl ethylenediamine, etc.

IT **75418-59-6**
(**anodes, batteries** containing, electrolytes for)
RN 75418-59-6 HCAPLUS
CN Lithium alloy, base, Li,Si (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Li | 7439-93-2 |
| Si | 7440-21-3 |

IC ICM H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** electrolyte solvent mixt; carbonate cyclic electrolyte lithium **battery**; oxide lithium nonaq **battery**; inhibitor lithium nonaq **battery**; trifluoromethanesulfonate lithium nonaq **battery**

IT **Batteries, primary**
(button-type, lithium alloy, with nonaq. electrolyte containing lithium trifluoromethanesulfonate and **cyclic carbonate**)

IT 71849-42-8 71849-43-9, Lithium base, tin 72785-69-4 72785-91-2 72785-92-3 **75418-59-6** 77194-65-1, Calcium, lithium base 77194-67-3, Lithium base, strontium 77194-68-4, Barium, lithium base 77194-70-8 97838-40-9, Gallium, lithium base 97838-42-1
(**anodes, batteries** containing, electrolytes for)

IT 1313-13-9, Manganese dioxide, uses and miscellaneous 1313-27-5, Molybdenum oxide (MoO3), uses and miscellaneous 1314-62-1, Vanadium oxide (V2O5), uses and miscellaneous 1317-33-5, Molybdenum disulfide, uses and miscellaneous 1317-37-9, Iron sulfide (FeS) 1317-38-0, **Copper** oxide (CuO), uses and miscellaneous 11113-63-6, Graphite fluoride 11118-57-3, Chromium oxide 12039-13-3, Titanium disulfide
(**cathodes**, lithium alloy **batteries** containing, electrolytes for)

IT 78-40-0, Triethyl phosphate 110-18-9 126-73-8, Phosphoric acid tributyl ester, uses and miscellaneous 147-84-2, reactions 150-61-8 7790-69-4, Lithium nitrate 7803-65-8 127204-51-7
(corrosion inhibitors, electrolyte containing, for nonaq. lithium alloy **batteries**)

IT 96-48-0, γ-Butyrolactone 96-49-1, 1,3-Dioxolan-2-one 108-32-7, Propylene carbonate 109-99-9, THF, uses and miscellaneous 110-71-4 126-33-0, Sulfolane 4437-85-8, Butylene carbonate
(electrolyte solvents containing, for lithium trifluoromethanesulfonate, in lithium alloy **batteries**)

L50 ANSWER 17 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:199244 HCAPLUS Full-text
DOCUMENT NUMBER: 106:199244
TITLE: Laminar lithium **battery**
INVENTOR(S): Nagai, Tatsu; Matsumoto, Kazunobu; Kitagawa, Satoshi; Kajita, Kozo; Manabe, Toshikatsu
PATENT ASSIGNEE(S): Hitachi Maxell, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| JP 62022375 | A | 19870130 | JP 1985-162254 | 19850722 |
| PRIORITY APPLN. INFO.: | | | JP 1985-162254 | 19850722 |

ED Entered STN: 13 Jun 1987

AB A mixture of a Li salt and a polymer containing cyclic carbonate esters is used as an electrolyte for a laminar Li **battery**. A solution of 22.4 g LiBPh4.3MeOC2H4OMe in 40 mL propylene carbonate is mixed with 12.35 g poly(1-vinyl-1,2-propanediolcycliccarbonate) having an average mol. weight of 10,000, sealed, and heated at 130° for 30 min to obtain a viscous electrolyte having an ionic conductivity of 1.0 + 10-3 S/cm at 25°. A 30:70 (volume) mixture of this electrolyte and TiS2 was screen printed on a stainless steel plate to form a 0.1 mm-thick **cathode** layer within a polypropylene frame formed on the

plate. A 25-μ corrugated porous polypropylene separator impregnated with the electrolyte and a Li-Al alloy **anode** were laid on top of the **cathode** successively, and a stainless steel **anode collector** plate was sealed to the frame via a modified polyolefin hot-melt binder to form a **battery**. No leaking or spreading of the electrolyte was observed during assembly. This **battery** had a cycle life much longer than a **battery** using an electrolyte without the polymer.

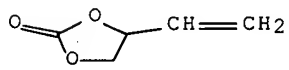
IT **43048-32-4**
(electrolytes, containing lithium tetraphenylborate-dimethoxyethane complex, for laminar lithium **batteries**)

RN 43048-32-4 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4427-96-7
CMF C5 H6 O3



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST lithium tetraphenylborate polycycliccarbonate **battery** electrolyte

IT **Batteries, secondary**
(lithium-titanium sulfide, laminar, electrolytes from mixts. of lithium tetraphenylborate-dimethoxyethane adduct and poly(cyclic carbonate esters) for)

IT 75965-35-4
(electrolytes from mixts. of poly(cyclic carbonate esters) and, for laminar lithium **batteries**)

IT 463-79-6D, Carbonic acid, cyclic esters with poly(vinyl alc.)
9002-89-5D, Poly(vinyl alcohol), cyclic carbonate esters
**43048-32-4** 108232-11-7 108232-12-8 108232-13-9
(electrolytes, containing lithium tetraphenylborate-dimethoxyethane complex, for laminar lithium **batteries**)

```
=> d que 151
L1             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  US20040151987/PN
L3             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  "VINYLETHYLENE CARBONATE"
                 /CN
L4             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN
L5             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  SILICON/CN
L6         78262 SEA FILE=REGISTRY ABB=ON  PLU=ON  SILICON?/CN
L7            11 SEA FILE=REGISTRY ABB=ON  PLU=ON  VINYLETHYLENE CARBONATE?/
                 CN
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L9       1448948 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5 OR L6 OR SILICON?
L10          265 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3 OR L7 OR  VINYLETHYLENE
                  CARBONAT?
L11           26 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3/D  OR L3/DP OR L7/DP
                 OR L7/D
L12          265 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11
L13        18754 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "BATTERY ANODES"+PFT,NT,OL
                 D,NEW/CT
L14         2727 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L13
L15            1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L1
L16            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L12
L17        71789 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SECONDARY BATTERIES"+PFT,
                 NT,OLD,NEW/CT
L18           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L12 AND L17
L19           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND L12 AND (BATTER?
                 OR ANOD? OR CATHOD? OR ELECTROD?)
L20           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 OR L19
L21            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 AND L9
L22           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 OR L16 OR L20 OR L21
L23       121454 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 AND (L13 OR L17 OR
                 BATTER? OR ANOD? OR CATHOD? OR ELECTROD?)
L24        13595 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 AND L9
L25            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND L12
L26          645 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND  (CURRENT
                 COLLECT? OR COLLECT?)
L27          467 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND ELECTROCHEM?/SC,SX

L28            3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L27 AND CYCLIC CARBONAT?
L29            7 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND CYCLIC CARBONAT?
L30           14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 OR L25 OR L28 OR L29
L31           48 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L27 AND NEGATIVE ELECTROD?

L33           36 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 AND CURRENT COLLECT?
L34           36 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L33 NOT L30
L36           36 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND  L9
L37            0 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L36 AND  L12
L38            0 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L36 AND  CYCLIC CARBONAT?

L39            0 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L36 AND  CYCLIC(2A)CARBONA
                 T?
L40           19 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L36 AND CARBONAT?
L41           36 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L36 OR L37 OR L38 OR L39
                 OR L40)
L42          163 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 AND (L13 OR L17 OR
                 BATTER? OR ANOD? OR CATHOD? OR ELECTROD?)
L43            1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND COPPER FOIL?
L44           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND L8
L46          109 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND  (NEGATIVE
```

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                ELECTROD? OR ANOD?)
L47           2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L46 AND CURRENT(A)COLLECT?

L48           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L46 AND COLLECT?
L49          13 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L43 OR L44 OR L47 OR L48
L50          17 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 OR L30
L51          36 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L41 NOT L50


=> d l51 1-36 ibib ed abs hitstr hitind

L51  ANSWER 1 OF 36  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2007:706242  HCAPLUS  Full-text
DOCUMENT NUMBER:          147:169876
TITLE:                    Lithium ion secondary battery with heat
                          resisting layers for preventing short circuit
INVENTOR(S):              Fujikawa, Masato; Inoue, Kaoru; Shimada, Mikinari
PATENT ASSIGNEE(S):       Matsushita Electronic Industrial Co., Ltd., Japan
SOURCE:                   Faming Zhuanli Shenqing Gongkai Shuomingshu, 25pp.
                          CODEN: CNXXEV
DOCUMENT TYPE:            Patent
LANGUAGE:                 Chinese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

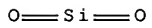
     PATENT NO.           KIND   DATE        APPLICATION NO.          DATE
     ---------------      ----   --------    ---------------------    --------
     CN 1983682            A     20070620    CN 2007-10008331         20070119
     US 2007172736         A1    20070726    US 2007-698094           20070126
PRIORITY APPLN. INFO.:                       JP 2006-17891       A    20060126

ED   Entered STN:  29 Jun 2007
AB   The title lithium ion secondary battery comprises a pos. electrode including a
     belt-like pos. electrode current collector and pos. electrode active material
     layers coated on each surface of the pos. electrode current collector, a neg .
     electrode including a belt-like neg. electrode current collector and neg.
     electrode active material layers coated on each surface of the neg. electrode
     current collector, a separator disposed between the two electrodes, and non-
     aqueous electrolyte, wherein at least one of the pos. and neg. electrode
     current collectors forms an exposed part without active material thereon at a
     real vertical center part, and the exposed part is connected with a current
     collecting wire.  A first heat resisting layer is formed opposite to at least
     part of the current collecting wire, and a second heat resisting layer is
     formed facing to active material layer opposite to the current collecting
     wire.  Owing to heat resisting layers, short circuit in battery can be
     prevented, and good safety and high output power can be obtained.
IT   7440-50-8, Copper, uses 7631-86-9,
     Silicon dioxide, uses
        (lithium ion secondary battery with heat resisting layers
        for preventing short circuit)
RN   7440-50-8  HCAPLUS
CN   Copper  (CA INDEX NAME)


Cu


RN   7631-86-9  HCAPLUS
```

CN Silica (CA INDEX NAME)



CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium ion secondary **battery** short circuit safety
IT Nitrile rubber, uses
(hydrogenated, BM 720H; lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT Safety
Short circuits
(lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT Carbon black, uses
Fluoropolymers, uses
(lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT **Secondary batteries**
(lithium, lithium-ion; lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT 24937-79-9, PVDF
(Kureha PVDF 1320; lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT 24938-64-5P, PPTA 25038-81-7P 26354-91-6P
(lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT 96-49-1, Ethylene **carbonate** 616-38-6, Methyl **carbonate** 623-53-0, Ethyl methyl **carbonate** 872-36-6, Vinylene **carbonate** 1309-48-4, Magnesium oxide, uses 1314-23-4, Zirconium oxide, uses 1344-28-1, Aluminum oxide, uses 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0, Nickel, uses **7440-50-8**, **Copper**, uses **7631-86-9**, **Silicon** dioxide, uses 7782-42-5, Graphite, uses 9002-88-4, Polyethylene 9004-32-4, Carboxymethylcellulose 21324-40-3, Lithium hexafluorophosphate 52627-24-4, Cobalt lithium oxide 815594-01-5, BM 400B
(lithium ion secondary **battery** with heat resisting layers for preventing short circuit)
IT 9003-18-3D, hydrogenated
(nitrile rubber; lithium ion secondary **battery** with heat resisting layers for preventing short circuit)

L51 ANSWER 2 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:702573 HCAPLUS Full-text
DOCUMENT NUMBER: 147:121870
TITLE: Nonaqueous electrolyte secondary **battery**
INVENTOR(S): Hasegawa, Kazuhiro; Takahashi, Yasufumi; Tode, Shingo; Kinoshita, Akira; Kuwahara, Tatsuyuki; Fujimoto, Hiroyuki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 13pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2007148550 | A1 | 20070628 | US 2006-645805 | 20061227 |
| JP 2007200862 | A | 20070809 | JP 2006-317053 | 20061124 |
| PRIORITY APPLN. INFO.: | | | JP 2005-379230 A | 20051228 |
| | | | JP 2006-317053 A | 20061124 |

ED Entered STN: 29 Jun 2007

AB Low-temperature charge-discharge performance is improved in a non-aqueous electrolyte secondary **battery** that employs flake graphite as a **neg. electrode** active material. A non-aqueous electrolyte secondary **battery** includes a pos. **electrode** containing a pos. **electrode** active material capable of intercalating and deintercalating lithium ions, a **neg. electrode** containing a **neg. electrode** active material capable of intercalating and deintercalating lithium ions, and a non-aqueous electrolyte. The **neg. electrode** includes a mixture layer containing, as the **neg. electrode** active material, a graphite material having flake-shaped primary particles, a **current collector** made of **Cu** or a **Cu** alloy, and an intermediate layer disposed between the mixture layer and the **current collector** and composed of a material that intercalates and deintercalates lithium ions at a nobler potential than the graphite material.

IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(nonaq. electrolyte secondary **battery**)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

INCL 429245000; 429231950
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST nonaq electrolyte secondary **battery**
IT Vapor deposition process
(chemical; nonaq. electrolyte secondary **battery**)
IT Transition metal oxides
(lithium-containing; nonaq. electrolyte secondary **battery**)
IT **Battery anodes**
**Electrodeposition**
**Secondary batteries**
Sputtering
(nonaq. electrolyte secondary **battery**)
IT **copper** alloy, base
**silicon** alloy, base
tin alloy, base

(nonaq. electrolyte secondary **battery**)
IT 9000-11-7, CMC
(nonaq. electrolyte secondary **battery**)
IT 17341-24-1, uses
(nonaq. electrolyte secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 623-53-0, Ethyl methyl **carbonate** **7440-21-3, Silicon**, uses
7440-31-5, Tin, uses **7440-50-8, Copper**, uses
7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate
114435-02-8, Fluoroethylene **carbonate**
(nonaq. electrolyte secondary **battery**)

L51 ANSWER 3 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:702572 HCAPLUS Full-text
DOCUMENT NUMBER: 147:121869
TITLE: Rechargeable lithium **battery** and method for manufacturing the same
INVENTOR(S): Kobayashi, Naoya; Choi, Wan-Uk
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 13pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2007148549 | A1 | 20070628 | US 2006-614350 | | 20061221 |
| JP 2007172954 | A | 20070705 | JP 2005-367485 | | 20051221 |
| PRIORITY APPLN. INFO.: | | | JP 2005-367485 | A | 20051221 |
| | | | KR 2006-131841 | A | 20061221 |

ED Entered STN: 29 Jun 2007
AB A rechargeable lithium **battery** according to the present invention includes a pos. **electrode** including a pos. active material being capable of intercalating and deintercalating lithium; a **neg. electrode** including a neg. active material being capable of intercalating and deintercalating lithium; and a non-aqueous electrolyte. The **neg. electrode** includes a lithium-containing metal compound that is inactive for water, and can intercalate lithium during at least discharge. The rechargeable lithium **battery** has an irreversible capacity during a first charge and discharge, and has no problems such as dendrite, electrolyte decomposition, or dissoln. of a neg. **current collector**.
IT **7440-21-3, Silicon**, uses **11107-19-0**
**12645-62-4 12661-90-4 12668-55-2**
**37299-94-8, Silicon** boride **39365-72-5**
**50944-37-1 50955-74-3 53550-14-4**
**58977-56-3 60866-76-4, Silicon** arsenide
(method for manufacturing rechargeable lithium **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 11107-19-0 HCAPLUS

CN Iron alloy, nonbase, Fe,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Fe | 7439-89-6 |
| Si | 7440-21-3 |

RN 12645-62-4 HCAPLUS
CN Copper alloy, nonbase, Cu,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Cu | 7440-50-8 |
| Si | 7440-21-3 |

RN 12661-90-4 HCAPLUS
CN Chromium alloy, nonbase, Cr,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Cr | 7440-47-3 |
| Si | 7440-21-3 |

RN 12668-55-2 HCAPLUS
CN Manganese alloy, nonbase, Mn,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Mn | 7439-96-5 |
| Si | 7440-21-3 |

RN 37299-94-8 HCAPLUS
CN Boron silicide (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 39365-72-5 HCAPLUS
CN Nickel alloy, nonbase, Ni,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Ni | 7440-02-0 |
| Si | 7440-21-3 |

RN 50944-37-1 HCAPLUS
CN Magnesium alloy, nonbase, Mg,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Mg | 7439-95-4 |
| Si | 7440-21-3 |

RN 50955-74-3 HCAPLUS
CN Cobalt alloy, nonbase, Co,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Co | 7440-48-4 |
| Si | 7440-21-3 |

RN 53550-14-4 HCAPLUS
CN Silicon alloy, nonbase, Si,Y (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Si | 7440-21-3 |
| Y | 7440-65-5 |

RN 58977-56-3 HCAPLUS
CN Silver alloy, nonbase, Ag,Si (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Ag | 7440-22-4 |
| Si | 7440-21-3 |

RN 60866-76-4 HCAPLUS
CN Silicon arsenide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| As | x | 7440-38-2 |
| Si | x | 7440-21-3 |

INCL 429231950; 429231100; 429220000; 429231500; 429231800; 429219000; 029623100
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST rechargeable lithium **battery** fabrication method
IT **Secondary batteries**
(lithium; method for manufacturing rechargeable lithium **battery**)
IT **Battery anodes**
(method for manufacturing rechargeable lithium **battery**)
IT Fluoropolymers, uses
(method for manufacturing rechargeable lithium **battery**)
IT aluminum alloy, base
**silicon** alloy, base
tin alloy, base
(method for manufacturing rechargeable lithium **battery**)
IT 24937-79-9, Polyvinylidene fluoride
(method for manufacturing rechargeable lithium **battery**)
IT 7429-90-5, Aluminum, uses **7440-21-3**, **Silicon**, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses **11107-19-0** 11142-89-5 11144-43-7 12527-46-7, **Copper** lithium oxide (CuLi2O2) **12645-62-4** **12661-90-4** **12668-55-2** 36058-25-0, Iron lithium phosphate Fe2Li3(PO4)3 **37299-94-8**, **Silicon** boride **39365-72-5** **50944-37-1** **50955-74-3** **53550-14-4** **58977-56-3** **60866-76-4**, **Silicon** arsenide 84159-18-2, Lithium vanadium phosphate

Li3V2(PO4)3
(method for manufacturing rechargeable lithium **battery**)

L51 ANSWER 4 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:383077 HCAPLUS Full-text
DOCUMENT NUMBER: 146:405141
TITLE: Lithium secondary **battery**
INVENTOR(S): Kobayashi, Kei; Yagi, Hiromasa; Hirase, Masaki; Jito, Daizo; Sayama, Katsunobu
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 17pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2007077494 | A1 | 20070405 | US 2006-527716 | 20060927 |
| JP 2007095569 | A | 20070412 | JP 2005-285281 | 20050929 |
| PRIORITY APPLN. INFO.: | | | JP 2005-285281 A | 20050929 |

ED Entered STN: 05 Apr 2007
AB A lithium secondary **battery** is provided with a pos. **electrode**, a **neg. electrode**, a separator interposed between the pos. and **neg. electrodes**, and an **electrode** assembly having the **neg. electrode**, the pos. **electrode**, and the separator. The **neg. electrode** has a **neg. electrode current collector** and **neg. electrode** active material layers formed on resp. surfaces of the **neg. electrode current collector**. The **neg. electrode** active material layers are composed of an alloy containing **silicon**, which intercalates and deintercalates lithium, and iron, which does not intercalate or deintercalate lithium. At least a portion of the **electrode** assembly has a curved portion in which the **neg. electrode** active material layer disposed inward relative to the **neg. electrode current collector** contains a higher concentration of the iron than the **neg. electrode** active material layer disposed outward relative to the **neg. electrode current collector**.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

INCL 429231950; 429218100; 429245000

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery**
IT Vapor deposition process
(chemical; lithium secondary **battery**)
IT **Battery anodes**
Etching
Evaporation
Polishing
Sputtering
Surface roughness
(lithium secondary **battery**)
IT **Secondary batteries**
(lithium; lithium secondary **battery**)
IT Coating process
(plating; lithium secondary **battery**)
IT Coating process
(thermal spraying; lithium secondary **battery**)
IT **Copper** alloy, base
(lithium secondary **battery**)
IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-21-3**, **Silicon**, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses **7440-50-8**, **Copper**, uses
(lithium secondary **battery**)

L51 ANSWER 5 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:228343 HCAPLUS Full-text
DOCUMENT NUMBER: 146:277716
TITLE: Non-aqueous electrolyte secondary **battery**
INVENTOR(S): Saisho, Keiji; Yamamoto, Hidekazu; Kato, Yoshio; Murata, Tetsuyuki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 12pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2007048606 | A1 | 20070301 | US 2006-512150 | | 20060830 |
| CN 1925208 | A | 20070307 | CN 2006-10127626 | | 20060831 |
| PRIORITY APPLN. INFO.: | | | JP 2005-252173 | A | 20050831 |
| | | | JP 2006-208327 | A | 20060731 |
| | | | JP 2006-219318 | A | 20060811 |

ED Entered STN: 02 Mar 2007
AB To improve cycle characteristics in a nonaq. electrolyte secondary **battery** containing **silicon** as a **neg. electrode** active material. A nonaq. electrolyte secondary **battery** comprising a **neg. electrode** made of a **neg. electrode** active material containing **silicon**, a pos. **electrode**, and a nonaq. electrolyte containing an electrolyte salt and a solvent, wherein a 1st electrolyte salt containing boron and fluorine and a 2nd electrolyte salt having a decomposition rate on the surface of the **neg. electrode** during charging and discharging, which is lower than that of the 1st electrolyte salt, are used as the electrolyte salt.

IT **7440-21-3, Silicon**, uses
(**anode**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IT **7440-50-8, Copper**, uses
(foil, **current collector**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

INCL 429199000; 429218100
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**, 76
ST **carbonate** electrolyte salt secondary lithium **battery** **silicon** film **anode**
IT Electric capacitance
(discharge; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT **Carbonates**, uses
(esters; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT **Secondary batteries**
(lithium; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT **Battery electrodes**
**Battery** electrolytes
(non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT Carbon black, uses
Fluoropolymers, uses
Polyesters, uses
(non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT Electrolysis kinetics
(of electrolyte salts; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT Electron beam evaporation
Vapor deposition process
(of **silicon**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT Coating process
(plating; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)
IT Sputtering

(radio-frequency, of **silicon**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT Polyolefins
(separator; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT **7440-21-3, Silicon**, uses
(**anode**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 25038-59-9, uses
(case; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 872-36-6, Vinylene **carbonate**
(electrolyte additive; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 14283-07-9, Lithium tetrafluoroborate
(electrolyte; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 21324-40-3, Lithium hexafluorophosphate
(electrolyte; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 7429-90-5, Aluminum, uses
(foil, **current collector** and case; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT **7440-50-8, Copper**, uses
(foil, **current collector**; non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 7789-24-4, Lithium fluoride, formation (nonpreparative)
(non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 7440-42-8D, Boron, compound 7782-41-4D, Fluorine, compound 12190-79-3, Cobalt lithium oxide (CoLiO2)
(non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132843-44-8, Lithium bis(pentafluoroethanesulfonyl)imide
(non-aqueous electrolyte secondary **battery** with **silicon** film **electrode**)

L51 ANSWER 6 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1079984 HCAPLUS Full-text
DOCUMENT NUMBER: 146:166375
TITLE: **Negative electrode** thin film for lithium polymer **battery** employing **negative electrode** active material layer made of **silicon** coated with nickel
INVENTOR(S): Kim, Hyung Sik; Park, Jae Chul; You, Dong Hwan; Jeon, Young Tae
PATENT ASSIGNEE(S): Digital Tech Co., Ltd., S. Korea
SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DOCUMENT TYPE: Patent
LANGUAGE: Korean
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| KR 2006025313 | A | 20060321 | KR 2004-74053 | 20040916 |
| PRIORITY APPLN. INFO.: | | | KR 2004-74053 | 20040916 |

ED Entered STN: 17 Oct 2006

AB Provided are a **neg. electrode** thin film for a lithium polymer **battery**, and its preparation method, to inhibit the expansion and contraction of volume of **silicon** during charge/discharge, thereby improving cycle characteristic. The **neg. electrode** thin film is provided with a **current collector**, and a **neg. electrode** active material layer formed on the **current collector**, wherein the **neg. electrode** active material layer is a thin film comprising **silicon** coated with nickel. Preferably a buffer layer comprising at least one selected from the group consisting of vanadium, nickel, molybdenum and **copper**.

IT **7440-50-8, Copper**, uses
(buffer layer; **neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

IT **7440-21-3, Silicon**, uses
(**neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST **silicon** coating nickel **neg electrode** lithium secondary **battery**

IT **Secondary batteries**
(lithium; **neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

IT **Battery anodes**
(**neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

IT Coating materials
(nickel; **neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

IT 7439-98-7, Molybdenum, uses **7440-50-8, Copper**,

uses 7440-62-2, Vanadium, uses
(buffer layer; **neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)
IT 7440-02-0, Nickel, uses
(coating; **neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)
IT **7440-21-3, Silicon**, uses
(**neg. electrode** thin film for lithium polymer **battery** employing **neg. electrode** active material layer made of **silicon** coated with nickel)

L51 ANSWER 7 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:635384 HCAPLUS Full-text
DOCUMENT NUMBER: 145:106831
TITLE: Lithium secondary **battery**
INVENTOR(S): Yanagida, Toshio; Minami, Hiroshi; Sunano, Taizou; Kamino, Maruo
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2006141359 | A1 | 20060629 | US 2005-316983 | 20051227 |
| JP 2006185830 | A | 20060713 | JP 2004-380102 | 20041228 |
| CN 1801520 | A | 20060712 | CN 2005-10107396 | 20051222 |
| KR 2006076716 | A | 20060704 | KR 2005-130520 | 20051227 |
| PRIORITY APPLN. INFO.: | | | JP 2004-380102 A | 20041228 |

ED Entered STN: 30 Jun 2006
AB Charge-discharge cycle performance is improved in a lithium secondary **battery** that adopts a thin film made of **silicon** or a **silicon** alloy as its **neg. electrode** active material and has a wound **electrode** structure. The lithium secondary **battery** includes: a **neg. electrode** having a **current collector** and a thin film made of **silicon** or a **silicon** alloy as a **neg. electrode** active material, the thin film provided on the **current collector**; a pos. **electrode**; a separator; the pos. and **neg. electrodes** being overlapped with the separator interposed therebetween, and the pos. and **neg. electrodes** and the separator being wound around to form an **electrode** assembly; a nonaq. electrolyte; and a **battery** case accommodating the **electrode** assembly. The ratio of charge capacity per unit area of the **neg. electrode** to theor. capacity per unit area of the pos. **electrode** is within the range of from 1.9 to 4.4.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses **50955-74-3 246539-14-0**
(lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 50955-74-3 HCAPLUS
CN Cobalt alloy, nonbase, Co,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Co | 7440-48-4 |
| Si | 7440-21-3 |

RN 246539-14-0 HCAPLUS
CN Silicon alloy, base, Si 70,Co 30 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 70 | 7440-21-3 |
| Co | 30 | 7440-48-4 |

INCL 429218100; 429245000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery**
IT **Battery anodes**
(lithium secondary **battery**)
IT **Secondary batteries**
(lithium; lithium secondary **battery**)
IT Sputtering
(radio-frequency; lithium secondary **battery**)
IT **Copper** alloy, base
**Silicon** alloy, base
(lithium secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 124-38-9, Carbon dioxide, uses **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate **50955-74-3 246539-14-0**
(lithium secondary **battery**)

L51 ANSWER 8 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:605329 HCAPLUS Full-text
DOCUMENT NUMBER: 145:86528
TITLE: Method of fabrication of **anode** for lithium ion secondary **battery**
INVENTOR(S): Kogetsu, Yasutaka; Honda, Kazuyoshi; Sato, Toshitada; Yoshizawa, Hiroshi
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 24 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent

LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2006134518 | A1 | 20060622 | US 2005-301027 | 20051213 |
| JP 2006196447 | A | 20060727 | JP 2005-350294 | 20051205 |
| CN 1787253 | A | 20060614 | CN 2005-10136944 | 20051215 |
| KR 2006069295 | A | 20060621 | KR 2005-123846 | 20051215 |
| PRIORITY APPLN. INFO.: | | | JP 2004-364342 A | 20041216 |

ED Entered STN: 23 Jun 2006
AB The invention concerns a **neg. electrode** for a lithium ion secondary **battery** including a **current collector** and an active material layer carried on the **current collector**, wherein the active material layer includes a first layer and a second layer alternately laminated in a thickness direction of the active material layer, and wherein the first layer includes **silicon** or **silicon** and a small amount of oxygen and the second layer includes **silicon** and a larger amount of oxygen than the first layer. With the use of the **neg. electrode**, it is possible to provide a high capacity lithium ion secondary **battery** having excellent high rate charge/discharge characteristics and superior cycle characteristics.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses **113671-38-8, Silicon** oxide (SiO0-2) **115987-45-6, Silicon** oxide (SiO1.9) **116551-27-0, Silicon** oxide (SiO0-1)
(method of fabrication of **anode** for lithium ion secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 113671-38-8 HCAPLUS
CN Silicon oxide (SiO0-2) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0 - 2 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 115987-45-6 HCAPLUS
CN Silicon oxide (SiO1.9) (CA INDEX NAME)

| Component | Ratio | Component |
|---|---|---|

| | | Registry Number |
|---|---|---|
| O | 1.9 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 116551-27-0 HCAPLUS
CN Silicon oxide (SiO0-1) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0 - 1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

INCL 429218100; 427058000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** fabrication lithium secondary **battery**
IT **Secondary batteries**
(lithium; method of fabrication of **anode** for lithium ion secondary **battery**)
IT **Battery anodes**
Sputtering
Vapor deposition process
(method of fabrication of **anode** for lithium ion secondary **battery**)
IT 108-32-7, Propylene **carbonate** 616-38-6, Dimethyl **carbonate** **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses 21324-40-3, Lithium hexafluorophosphate **113671-38-8**, **Silicon** oxide (SiO0-2) **115987-45-6**, **Silicon** oxide (SiO1.9) **116551-27-0**, **Silicon** oxide (SiO0-1)
(method of fabrication of **anode** for lithium ion secondary **battery**)
IT 12190-79-3P, Cobalt lithium oxide (CoLiO2)
(method of fabrication of **anode** for lithium ion secondary **battery**)

L51 ANSWER 9 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:544551 HCAPLUS Full-text
DOCUMENT NUMBER: 145:11411
TITLE: Method of fabrication of **anode** for nonaqueous electrolyte secondary **battery**
INVENTOR(S): Sato, Toshitada; Kogetsu, Yasutaka; Yoshizawa, Hiroshi
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2006121351 | A1 | 20060608 | US 2005-289681 | 20051130 |
| JP 2006164793 | A | 20060622 | JP 2004-355689 | 20041208 |
| PRIORITY APPLN. INFO.: | | | JP 2004-355689 A | 20041208 |

ED Entered STN: 09 Jun 2006

AB In a **neg. electrode** for a non-aqueous electrolyte secondary **battery** including an active material portion capable of electrochem. absorbing and desorbing Li, a **current collector** carrying the active material portion, and a buffer interposed between the active material portion and the **current collector**, the active material portion includes at least one selected from the group consisting of a Si simple substance, a Si alloy, and a Si compound, the **current collector** includes **Cu**, and the buffer has a first layer contacting the **current collector** and including a group A element which is at least one selected from the group A consisting of Sn, Al, and In, and a second layer contacting the active material portion and including a group B element which is at least one selected from the group B consisting of transition metal elements other than **Cu** .

IT **7440-21-3, Silicon**, uses **7440-21-3D**, **Silicon**, compound **7440-50-8, Copper**, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)


RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)


RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)


INCL 429231950; 429218100; 429220000; 427123000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** fabrication nonaq electrolyte secondary **battery**
IT Degreasing
(alkaline; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT **Battery anodes**
**Electrodeposition**
**Secondary batteries**
Tinplate
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT Fluoropolymers, processes
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Transition metals, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT **Silicon** alloy, base
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT 9002-84-0, FA 100
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses **7440-21-3**, **Silicon**, uses **7440-21-3D**, **Silicon**, compound 7440-31-5, Tin, uses **7440-50-8**, **Copper**, uses 7440-74-6, Indium, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT 7439-93-2, Lithium, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

L51 ANSWER 10 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:121966 HCAPLUS Full-text
DOCUMENT NUMBER: 144:174387
TITLE: Method of fabrication of **anode** for nonaqueous electrolyte secondary **battery**
INVENTOR(S): Koshina, Hizuru; Nakanishi, Shinji
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 15 pp., Cont.-in-part of U.S. Ser. No. 924,926.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2006029862 | A1 | 20060209 | US 2005-240417 | 20051003 |
| US 2005048369 | A1 | 20050303 | US 2004-924926 | 20040825 |
| PRIORITY APPLN. INFO.: | | | JP 2003-305348 A | 20030828 |
| | | | US 2004-924926 A2 | 20040825 |

ED Entered STN: 09 Feb 2006
AB A **neg. electrode** capable of giving a nonaq. electrolyte secondary **battery** which has high capacity, long cycle life and excellent safety, and exhibits an excellent cycle characteristic even when charging/deep-discharging is disclosed. The **neg. electrode** comprises a **current collector** sheet and an active material layer deposited on the surface of the **current collector** sheet, wherein the active material layer comprises SiOx satisfying: $0.6 \leq x \leq 1.3$, and does not include a binder.
IT **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses **12192-10-8**, **Silicon** oxide SiO0.5 **107875-69-4**, **Silicon** oxide (SiO1.1) **111446-23-2**, **Silicon** oxide (SiO1.3) **113443-18-8**, **Silicon** oxide (SiO) **114823-39-1**, **Silicon** oxide (SiO0.9) **126447-59-4**, **Silicon** oxide (SiO0.7) **129737-53-7**, **Silicon** oxide (SiO0.3) **146021-77-4**, **Silicon** oxide (SiO0.6) **874810-56-7**, **Silicon** oxide (SiO0.6-1.3)
(method of fabrication of **anode** for nonaq. electrolyte

secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 12192-10-8 HCAPLUS
CN 1,3-Disiloxanediylidyne (9CI) (CA INDEX NAME)

Si—O—Si

RN 107875-69-4 HCAPLUS
CN Silicon oxide (SiO1.1) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1.1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 111446-23-2 HCAPLUS
CN Silicon oxide (SiO1.3) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1.3 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 113443-18-8 HCAPLUS
CN Silicon oxide (SiO) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 114823-39-1 HCAPLUS
CN Silicon oxide (SiO0.9) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.9 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 126447-59-4 HCAPLUS
CN Silicon oxide (SiO0.7) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.7 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 129737-53-7 HCAPLUS
CN Silicon oxide (SiO0.3) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.3 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 146021-77-4 HCAPLUS
CN Silicon oxide (SiO0.6) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.6 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 874810-56-7 HCAPLUS
CN Silicon oxide (SiO0.6-1.3) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.6 - 1.3 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

INCL 429218100; 429245000; 429234000; 427058000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** fabrication nonaq electrolyte secondary **battery**; safety **anode** fabrication nonaq electrolyte secondary **battery**
IT Polyamide fibers, uses
(aramid; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT Carbon fibers, uses
(graphite; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT **Battery anodes**
**Secondary batteries**
Vapor deposition process
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)
IT Carbon black, uses
Carbonaceous materials (technological products)
Fluoropolymers, uses

Styrene-butadiene rubber, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Phenolic resins, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyamides, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polycarbonates, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyesters, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyimides, uses
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyketones
(polyether-; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyethers, uses
(polyketone-; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0, Nickel, uses **7440-21-3, Silicon**, uses 7440-22-4, Silver, uses **7440-50-8, Copper**, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses **12192-10-8, Silicon** oxide SiO0.5 **107875-69-4, Silicon** oxide (SiO1.1) **111446-23-2, Silicon** oxide (SiO1.3) **113443-18-8, Silicon** oxide (SiO) **114823-39-1**, **Silicon** oxide (SiO0.9) **126447-59-4, Silicon** oxide (SiO0.7) **129737-53-7, Silicon** oxide (SiO0.3) **146021-77-4, Silicon** oxide (SiO0.6) **874810-56-7, Silicon** oxide (SiO0.6-1.3)
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT 7782-42-5, Graphite, uses 24937-79-9, PVDF
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT 9003-07-0, Polypropylene 25038-59-9, uses 25667-42-9, Polyether sulfone 31694-16-3
(method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

IT 9003-55-8
(styrene-butadiene rubber; method of fabrication of **anode** for nonaq. electrolyte secondary **battery**)

L51 ANSWER 11 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1078029 HCAPLUS Full-text
DOCUMENT NUMBER: 143:350012
TITLE: Lithium secondary **battery**
INVENTOR(S): Yoshida, Toshikazu; Kamino, Manio
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2005221189 | A1 | 20051006 | US 2005-91942 | 20050329 |
| JP 2005285651 | A | 20051013 | JP 2004-100359 | 20040330 |
| CN 1677717 | A | 20051005 | CN 2005-10062777 | 20050330 |
| KR 2006045145 | A | 20060516 | KR 2005-26435 | 20050330 |
| PRIORITY APPLN. INFO.: | | | JP 2004-100359 A | 20040330 |

ED Entered STN: 07 Oct 2005

AB A lithium secondary **battery** includes a **neg. electrode**, a pos. **electrode**, and a non-aqueous electrolyte. The **neg. electrode** includes a **neg. electrode current collector** having an irregular surface and a **neg. electrode** active material layer formed on the surface. In the lithium secondary **battery**, the **neg. electrode** active material layer is composed of a material that alloys with Li; thickness of the **neg. electrode** active material layer (μm)/10-point mean surface roughness of the **neg. electrode current collector** (μm) is in the range of from 0.5 to 4; and tensile strength of the **neg. electrode current collector** (N/mm2) at 25° + the **neg. electrode** **current collector** base thickness (mm)/thickness of the **neg. electrode** active material layer (μm) on one side of **current collector** is 2 or greater.

IT **7440-21-3, Silicon**, uses
(lithium secondary **battery**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-40
ICS H01M004-70; H01M004-58

INCL 429231950; 429233000

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST lithium secondary **battery**

IT **Secondary batteries**
(lithium; lithium secondary **battery**)

IT **Copper** alloy, base
(lithium secondary **battery**)

IT **7440-21-3, Silicon**, uses
(lithium secondary **battery**)

L51 ANSWER 12 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:497319 HCAPLUS Full-text

DOCUMENT NUMBER: 143:29527

TITLE: Method for manufacturing lithium secondary **battery**

INVENTOR(S): Fukui, Atsushi; Minami, Hiroshi; Sawa, Shoichiro; Torimae, Mariko; Kusumoto, Yasuyuki; Kamino, Maruo

PATENT ASSIGNEE(S): Japan

SOURCE: U.S. Pat. Appl. Publ., 17 pp.
CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2005123829 | A1 | 20050609 | US 2004-1192 | | 20041202 |
| JP 2005166530 | A | 20050623 | JP 2003-405748 | | 20031204 |
| CN 1624967 | A | 20050608 | CN 2004-10098047 | | 20041202 |
| KR 2005054459 | A | 20050610 | KR 2004-100849 | | 20041203 |
| PRIORITY APPLN. INFO.: | | | JP 2003-405748 | A | 20031204 |

ED Entered STN: 10 Jun 2005

AB A lithium secondary **battery** of the invention comprises a pos. **electrode** formed by disposing a pos.-**electrode** mixture layer containing a pos.-**electrode** active material and a pos.-**electrode** binder, on a surface of a pos.- **electrode current collector**; a **neg** . **electrode** formed by sintering a **neg**.- **electrode** mixture layer containing a **neg**.- **electrode** binder and a **neg**.-**electrode** active material containing **silicon** and/or a **silicon** alloy, disposed on a surface of a **neg**.-**electrode current collector**; a separator disposed between the pos. **electrode** and the **neg**. **electrode**; and a nonaq. electrolyte; wherein an **electrode** unit obtained by setting the pos. **electrode** and the **neg**. **electrode** opposed to each other through the separator and rolling them in spirally rolled state is placed in a cylindrical **battery** container and wherein a curvature radius of the **neg**.-**electrode** mixture layer opposed to the pos.- **electrode** mixture layer through the separator in the spirally rolled state is 1.5 mm or larger.

IT **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses
(method for manufacturing lithium secondary **battery**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

IC ICM H01M002-02
ICS H01M004-66; H01M004-62; H01M004-58

INCL 429164000; 429094000; 429245000; 429217000; 429218100; 429232000; 029623100

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST lithium secondary **battery** manufg method

IT **Secondary batteries**
(lithium; method for manufacturing lithium secondary **battery**)

IT Heat treatment
Sintering
(method for manufacturing lithium secondary **battery**)

IT Polyimides, uses
(method for manufacturing lithium secondary **battery**)

IT **Copper** alloy, base

**Silicon** alloy, base
(method for manufacturing lithium secondary **battery**)
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(method for manufacturing lithium secondary **battery**)

L51 ANSWER 13 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:429260 HCAPLUS Full-text
DOCUMENT NUMBER: 142:466540
TITLE: Lithium secondary **battery**
INVENTOR(S): Minami, Hiroshi; Yagi, Hiromasa; Sayama, Katsunobu; Kamino, Maruo
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2005106465 | A1 | 20050519 | US 2004-992081 | | 20041119 |
| JP 2005150039 | A | 20050609 | JP 2003-389847 | | 20031119 |
| PRIORITY APPLN. INFO.: | | | JP 2003-389847 | A | 20031119 |

ED Entered STN: 20 May 2005
AB Charge-discharge cycle performance is improved in a lithium secondary **battery** including a **neg. electrode** containing a **neg. electrode** active material having **silicon** as its main component, provided on a surface of a **current collector**, a pos. **electrode** containing a pos. **electrode** active material, and a nonaq. electrolyte. The pos. **electrode** active material is a lithium transition metal oxide containing Li and Co and having a layered structure, and further containing a group IVA element of the periodic table, such as Zr, Ti, or Hf, and a group IIA element of the periodic table, such as Mg.
IT **7440-21-3, Silicon**, uses
(lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-58
ICS H01M002-26; H01M002-28; H01M006-16
INCL 429231950; 429330000; 429338000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery**
IT Vapor deposition process
(chemical; lithium secondary **battery**)
IT Transition metal oxides
(lithiated; lithium secondary **battery**)
IT **Battery anodes**
Evaporation
Sputtering
(lithium secondary **battery**)

IT Alkaline earth metals
Group IVA elements
(lithium secondary **battery**)
IT **Secondary batteries**
(lithium; lithium secondary **battery**)
IT Coating process
(plating; lithium secondary **battery**)
IT Coating process
(thermal spraying; lithium secondary **battery**)
IT **Copper** alloy, base
(lithium secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 7440-21-3, **Silicon**, uses 7440-48-4, Cobalt, uses 52627-24-4, Cobalt lithium oxide
(lithium secondary **battery**)
IT 7439-95-4, Magnesium, uses 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses
(lithium secondary **battery**)

L51 ANSWER 14 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:429259 HCAPLUS Full-text
DOCUMENT NUMBER: 142:466539
TITLE: Lithium secondary **battery**
INVENTOR(S): Yoshida, Toshikazu; Sakitani, Nobuhiro; Kamino, Maruo; Tarui, Hasaki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2005106464 | A1 | 20050519 | US 2004-991927 | 20041119 |
| JP 2005150038 | A | 20050609 | JP 2003-389845 | 20031119 |
| KR 2005048509 | A | 20050524 | KR 2004-94409 | 20041118 |
| CN 1619875 | A | 20050525 | CN 2004-10094927 | 20041118 |
| PRIORITY APPLN. INFO.: | | | JP 2003-389845 A | 20031119 |

ED Entered STN: 20 May 2005
AB Charge-discharge cycle performance is improved in a lithium secondary **battery** that uses a material that occludes lithium by alloying with lithium as its **neg. electrode** active material. A lithium secondary **battery** comprises a **neg. electrode** having a **neg. electrode** active material thin film provided on a **neg . electrode current collector**, a pos. **electrode** including a pos. **electrode** active material, and a nonaq. electrolyte, in which the **neg. electrode** active material is a material that occludes lithium by alloying with lithium, the ratio of the discharge capacity per unit area of the **neg. electrode** to the discharge capacity per unit area of the pos. **electrode** is from 1.5 to 3, and the ratio of the thickness (μm) of the **neg. electrode** active material to the arithmetical mean roughness (μm) of the surface of the **neg. electrode current collector** is 50 or less.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-58
ICS H01M004-64
INCL 429231950; 429233000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery**
IT **Battery anodes**
(lithium secondary **battery**)
IT **Secondary batteries**
(lithium; lithium secondary **battery**)
IT Sputtering
(radio-frequency; lithium secondary **battery**)
IT Lithium alloy, base
(lithium secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 7440-21-3, **Silicon**, uses **7440-50-8**, **Copper**, uses 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate
(lithium secondary **battery**)

L51 ANSWER 15 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:259461 HCAPLUS Full-text
DOCUMENT NUMBER: 142:339049
TITLE: **Anodes** for nonaqueous electrolyte secondary **battery**
INVENTOR(S): Sato, Toshitada; Nakai, Miyuki; Igaki, Emiko; Bito, Yasuhiko
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 24 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2005064291 | A1 | 20050324 | US 2004-933147 | 20040902 |
| JP 2005116509 | A | 20050428 | JP 2004-180183 | 20040617 |
| CN 1599099 | A | 20050323 | CN 2004-10079821 | 20040920 |
| PRIORITY APPLN. INFO.: | | | JP 2003-326520 A | 20030918 |

ED Entered STN: 25 Mar 2005

AB A **neg. electrode** for a nonaq. electrolyte secondary **battery** including a **current collector**, and an **electrode** material layer including an **electrode** material capable of reversibly absorbing and desorbing Li ions is provided. The **electrode** material includes at least one element selected from the group consisting of Si, Sn and Al; the surface of the **current collector** is provided with protrusions; the **electrode** material layer is disposed on the surfaces of the **current collector** and the protrusions; and the protrusion has a portion facing the surface of the **current collector** other than a portion that is brought into contact with the **current collector**. Thus, a **neg. electrode** for a nonaq. electrolyte **battery** having high properties such as an energy d., charging/discharging cycle property, and the like, and a nonaq. electrolyte secondary **battery** can be provided.

IT **7440-21-3, Silicon**, uses **56728-61-1**
(**anodes** for nonaq. electrolyte secondary **battery**
)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

RN 56728-61-1 HCAPLUS

CN Silicon alloy, nonbase, Si,Ti (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Si | 7440-21-3 |
| Ti | 7440-32-6 |

IT **7440-50-8, Copper**, uses
(particles; **anodes** for nonaq. electrolyte secondary **battery**)

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-70
ICS H01M004-58; H01M004-40; H01M004-66

INCL 429233000; X42-923.195; X42-924.5; X42-923.5; X42-923.4

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST **anode** nonaq electrolyte secondary **battery**

IT **Battery anodes**
(**anodes** for nonaq. electrolyte secondary **battery**
)

IT Metallic fibers
(**anodes** for nonaq. electrolyte secondary **battery**
)

IT Carbon fibers, uses
(**anodes** for nonaq. electrolyte secondary **battery**

)
IT Styrene-butadiene rubber, uses
(**anodes** for nonaq. electrolyte secondary **battery**
)
IT Polyesters, uses
(**anodes** for nonaq. electrolyte secondary **battery**
)
IT Metallic fibers
(**copper**; **anodes** for nonaq. electrolyte secondary **battery**)
IT Polyolefins
(film; **anodes** for nonaq. electrolyte secondary **battery**)
IT **Secondary batteries**
(lithium; **anodes** for nonaq. electrolyte secondary **battery**)
IT Metallic fibers
(nickel; **anodes** for nonaq. electrolyte secondary **battery**)
IT Metallic fibers
(stainless steel; **anodes** for nonaq. electrolyte secondary **battery**)
IT 7440-05-3, Palladium, uses
(**anodes** for nonaq. electrolyte secondary **battery**
)
IT 7429-90-5, Aluminum, uses **7440-21-3**, **Silicon**, uses
7440-31-5, Tin, uses **56728-61-1**
(**anodes** for nonaq. electrolyte secondary **battery**
)
IT 7439-93-2, Lithium, uses
(**anodes** for nonaq. electrolyte secondary **battery**
)
IT 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses **7440-50-8**
, **Copper**, uses
(particles; **anodes** for nonaq. electrolyte secondary **battery**)
IT 9003-55-8
(styrene-butadiene rubber; **anodes** for nonaq. electrolyte secondary **battery**)

L51 ANSWER 16 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:181162 HCAPLUS Full-text
DOCUMENT NUMBER: 142:264363
TITLE: Production of **anode** for nonaqueous electrolyte secondary **battery**
INVENTOR(S): Koshina, Hizuru; Nakanishi, Shinji
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 20 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1511100 | A2 | 20050302 | EP 2004-20278 | 20040826 |
| EP 1511100 | A3 | 20061004 | | |

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,

PL, SK, HR

| | | | | |
|---|---|---|---|---|
| JP 2005100959 | A | 20050414 | JP 2004-228168 | 20040804 |
| CN 1591932 | A | 20050309 | CN 2004-10064497 | 20040827 |
| PRIORITY APPLN. INFO.: | | | JP 2003-305348 | A 20030828 |

ED Entered STN: 04 Mar 2005

AB The invention concerns a **neg. electrode** capable of giving a nonaq. electrolyte secondary **battery** which has high capacity, long cycle life and excellent safety, and exhibits an excellent cycle characteristic even when charging/deep-discharging are repeated. The **neg. electrode** comprises a **current collector** sheet and an active material layer deposited on the surface of the **current collector** sheet, wherein the active material layer comprises SiOx satisfying: $0.7 \leq x \leq 1.3$, and does not include a binder. The **current collector** sheet may comprise a resin core layer and a metal layer coating the surface of the resin core layer.

IT **7440-50-8, Copper**, uses **113443-18-8, Silicon** oxide (SiO) **209108-84-9, Silicon** oxide (SiO0.7-1.3)
(production of **anode** for nonaq. electrolyte secondary **battery**)

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

RN 113443-18-8 HCAPLUS

CN Silicon oxide (SiO) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

RN 209108-84-9 HCAPLUS

CN Silicon oxide (SiO0.7-1.3) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 0.7 - 1.3 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

IC ICM H01M004-48
ICS H01M004-66

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **anode** prodn nonaq electrolyte secondary **battery**; safety **anode** nonaq electrolyte secondary **battery**

IT Polyamide fibers, uses
(aramid; production of **anode** for nonaq. electrolyte secondary **battery**)

IT Carbon fibers, uses
(graphite; production of **anode** for nonaq. electrolyte secondary **battery**)

IT Polyketones
Polysulfones, uses
(polyether-; production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polyethers, uses
(polyketone-; production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polyethers, uses
(polysulfone-; production of **anode** for nonaq. electrolyte secondary **battery**)
IT **Battery anodes**
**Secondary batteries**
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Fluoropolymers, uses
Styrene-butadiene rubber, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Carbon black, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Carbonaceous materials (technological products)
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Phenolic resins, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polyamides, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polycarbonates, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polyesters, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT Polyimides, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-22-4, Silver, uses **7440-50-8**, **Copper**, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 12190-79-3, Cobalt lithium oxide (CoLiO2) **113443-18-8**, **Silicon** oxide (SiO) **209108-84-9**, **Silicon** oxide (SiO0.7-1.3)
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT 24937-79-9, Pvdf
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT 7782-42-5, Graphite, uses 25038-59-9, uses
(production of **anode** for nonaq. electrolyte secondary **battery**)
IT 9003-55-8
(styrene-butadiene rubber; production of **anode** for nonaq. electrolyte secondary **battery**)

L51 ANSWER 17 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:36456 HCAPLUS Full-text
DOCUMENT NUMBER: 142:117693
TITLE: Method of fabrication of **anode** for

rechargeable lithium **battery**

INVENTOR(S): Cho, Chung-Kun; Hwang, Duck-Chul; Hwang, Seung-Sik; Lee, Sang-Mock

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2005008938 | A1 | 20050113 | US 2004-778319 | 20040217 |
| KR 2005007484 | A | 20050119 | KR 2003-46160 | 20030708 |
| CN 1577919 | A | 20050209 | CN 2004-10047712 | 20040305 |
| JP 2005044796 | A | 20050217 | JP 2004-200674 | 20040707 |

PRIORITY APPLN. INFO.: KR 2003-46160 A 20030708

ED Entered STN: 14 Jan 2005

AB A **neg. electrode** of a rechargeable lithium **battery** includes a **current collector**, a neg. active material layer on one side of the **current collector**, a protection layer on the neg. active material and a releasing layer on the other side of the **current collector**, or on the protection layer.

IT **7440-21-3D, Silicon**, compound
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(method of fabrication of **anode** for rechargeable lithium **battery**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

IC ICM H01M002-16
ICS H01M002-18

INCL 429246000; 429144000; 429249000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** fabrication rechargeable lithium **battery**
IT Conducting polymers
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT Phosphazenes
Polyesters, uses
Polyimides, uses
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT Fluoropolymers, uses
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT Polyolefins
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT Polyoxyalkylenes, uses
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT **Secondary batteries**
(lithium, Li-S; method of fabrication of **anode** for rechargeable lithium **battery**)
IT **Battery anodes**
(method of fabrication of **anode** for rechargeable lithium **battery**)
IT Polysiloxanes, uses
(method of fabrication of **anode** for rechargeable lithium **battery**)
IT Alkadienes
(polymers, layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT Plasma
(treatment; method of fabrication of **anode** for rechargeable lithium **battery**)
IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT **7440-21-3D, Silicon**, compound
(layer; method of fabrication of **anode** for rechargeable lithium **battery**)
IT 554-13-2, Lithium **carbonate** 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses 7440-09-7, Potassium, uses **7440-21-3, Silicon**, uses 7440-22-4, Silver, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-39-3, Barium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses **7440-50-8**, **Copper**, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 10377-52-3, Lithium phosphate 10544-50-0, Sulfur s8, uses 12627-14-4, Lithium silicate 12676-27-6 26134-62-3, Lithium nitride 37220-89-6, Lithium aluminate 39302-37-9, Lithium titanium oxide 152747-89-2, Lanthanum lithium oxide 184905-46-2, Lithium nitrogen phosphorus oxide 188596-59-0, Syl-off 7922 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide

236388-76-4, Lithium phosphide sulfide 342379-43-5, Germanium lithium sulfide
(method of fabrication of **anode** for rechargeable lithium **battery**)
IT 25038-59-9, uses
(method of fabrication of **anode** for rechargeable lithium **battery**)
IT 124-38-9, Carbon dioxide, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
(plasma; method of fabrication of **anode** for rechargeable lithium **battery**)

L51 ANSWER 18 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1149233 HCAPLUS Full-text
DOCUMENT NUMBER: 142:357982
TITLE: Large-capacity polymer-lithium ion **battery** and its manufacture
INVENTOR(S): Fu, Zhiguo; Wang, Chunsheng; Gao, Guopeng; Si, Hongjun; Mu, Yanmei
PATENT ASSIGNEE(S): Heilongjiang Zhongqiang Energy Resources Technologies Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 16 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| CN 1487617 | A | 20040407 | CN 2003-149865 | 20030730 |
| US 2005022370 | A1 | 20050203 | US 2004-861661 | 20040604 |
| US 6994737 | B2 | 20060207 | | |

PRIORITY APPLN. INFO.: CN 2003-149865 A 20030730

ED Entered STN: 29 Dec 2004
AB The method comprises: (1) pretreating Al **current collector** with a slurry prepared with ethylene-acrylate copolymer, conductive C black, and acetone and then coating the **current collector** with a slurry containing Li salt + Co oxide 60-70, poly(vinylidene difluoride) 5-10, conductive C black 8-15, and di-Bu phthalate 12-20% and acetone as solvent to obtain a pos. **electrode**, (2) similarly pretreating a **Cu current collector** and coating the pretreated **current collector** with a slurry prepared with carbonaceous material mixed with intercalation compound of Li 60- 70, poly(vinylidene difluoride) 6-15, conductive C black 9-15, and di-Bu phthalate 18-25%, and acetone as solvent to obtain a **neg. electrode**, (3) coating of a slurry prepared with poly(vinylidene difluoride) 40-65, vapor SiO2 4-10, and di-Bu phthalate 25-45%, and acetone as solvent on a polyester thin film to obtain a membrane, (4) laminating pos. **electrode**, membrane, and **neg. electrode** by hot pressing to obtain a unit **battery**, removing plasticizer from the unit **battery** by extraction with methanol anhydrate, (6) soldering **electrode** ears, (7) immersing the unit **battery** in an electrolyte solution, and (8) packaging and conditioning. The Li salt is Li manganate or Li nickelate, the Li intercalation-type carbonaceous material is meso C micro beads and/or graphite, and the electrolyte is LiPF6 or LiClO4 dissolved in vinyl **carbonate**, propylene **carbonate**, di-Me **carbonate**, and/or divinyl **carbonate**.
IT **7440-50-8, Copper**, uses **7631-86-9**, Silica, uses
(large capacity lithium **battery** containing)

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu ✓

RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)

O=Si=O

IC ICM H01M010-38
ICS H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST polymer lithium ion **battery** manuf
IT Carbon black, uses
Fluoropolymers, uses
(large capacity lithium **battery** containing)
IT **Battery anodes**
**Battery cathodes**
(lithium **battery**; fabrication process for)
IT **Secondary batteries**
(lithium-ion; fabrication process for)
IT 7791-03-9, Lithium perchlorate 9010-77-9, Ethylene-acrylic acid copolymer
(binder; large capacity lithium **battery** containing)
IT 1308-04-9, Cobaltic oxide 1308-06-1, Cobalto-cobaltic oxide 7429-90-5, Aluminum, uses **7440-50-8**, **Copper**, uses **7631-86-9**, Silica, uses 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese oxide (LiMn2O4) 21324-40-3, Lithium hexafluorophosphate 24937-79-9, Poly(vinylidene difluoride)
(large capacity lithium **battery** containing)

L51 ANSWER 19 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:934655 HCAPLUS Full-text
DOCUMENT NUMBER: 141:398173
TITLE: **Negative electrode** for nonaqueous electrolyte secondary **battery**, method for manufacturing same and nonaqueous electrolyte secondary **battery**
INVENTOR(S): Yasuda, Kiyotaka; Sakaguchi, Yoshiki; Musha, Shinichi; Dobashi, Makoto; Modeki, Akihiro; Matsushima, Tomoyoshi; Honda, Hitohiko; Taguchi, Takeo
PATENT ASSIGNEE(S): Mitsui Mining & Smelting Co., Ltd., Japan
SOURCE: PCT Int. Appl., 81 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| WO 2004095612 | A1 | 20041104 | WO 2003-JP16186 | 20031217 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| JP 2005044672 | A | 20050217 | JP 2003-278615 | 20030723 |
| JP 3643108 | B2 | 20050427 | | |
| JP 2005063767 | A | 20050310 | JP 2003-290726 | 20030808 |
| JP 2005093331 | A | 20050407 | JP 2003-327893 | 20030919 |
| JP 2005129264 | A | 20050519 | JP 2003-360938 | 20031021 |
| JP 3612669 | B2 | 20050119 | JP 2003-403528 | 20031202 |
| JP 2005063929 | A | 20050310 | | |
| AU 2003289402 | A1 | 20041119 | AU 2003-289402 | 20031217 |
| BR 2003017920 | A | 20051129 | BR 2003-17920 | 20031217 |
| CN 1711654 | A | 20051221 | CN 2003-80102999 | 20031217 |
| EP 1617497 | A1 | 20060118 | EP 2003-780852 | 20031217 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| RU 2303318 | C2 | 20070720 | RU 2005-118109 | 20031217 |
| US 2006147802 | A1 | 20060706 | US 2005-28661 | 20050105 |
| IN 2005KN00678 | A | 20060825 | IN 2005-KN678 | 20050419 |
| US 2006115735 | A1 | 20060601 | US 2005-522791 | 20050922 |
| PRIORITY APPLN. INFO.: | | | JP 2003-117833 A | 20030423 |
| | | | JP 2003-278615 A | 20030723 |
| | | | JP 2003-282294 A | 20030730 |
| | | | JP 2003-290726 A | 20030808 |
| | | | JP 2003-327893 A | 20030919 |
| | | | JP 2003-360938 A | 20031021 |
| | | | JP 2003-403528 A | 20031202 |
| | | | WO 2003-JP16186 W | 20031217 |

ED Entered STN: 06 Nov 2004

AB A **neg. electrode** for nonaq. electrolyte secondary **batteries** is disclosed. The **neg. electrode** comprises a pair of **collecting** surface layers whose surfaces are in contact with an electrolytic solution and at least one active material layer intervening between the surface layers and containing active material particles which have a high lithium compound forming power. It is preferable that the material constituting the surfaces permeates throughout the active material layer in the thickness direction so that the surfaces are elec. connected with each other, whereby the **electrode** has a **current collecting** function as a whole. The thickness of the surface layers is preferably 0.3-10 μm.

IT **7440-50-8, Copper,** uses

(nonaq. electrolyte lithium **battery cathode** containing)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **172173-80-7**
(nonaq. electrolyte lithium **battery cathode** containing)
RN 172173-80-7 HCAPLUS
CN Silicon alloy, base, Si 80,Ni 20 (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 80 | 7440-21-3 |
| Ni | 20 | 7440-02-0 |

IC ICM H01M004-02
ICS H01M004-38; H01M004-04; H01M010-40; H01M004-64
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST nonaq electrolyte lithium **battery cathode** **silicon** nickel alloy
IT **Battery cathodes**
(lithium **battery**; **silicon**-nickel alloy particles for)
IT 7440-02-0, Nickel, uses 7440-31-5, Tin, uses **7440-50-8**, **Copper**, uses
(nonaq. electrolyte lithium **battery cathode** containing)
IT **172173-80-7**
(nonaq. electrolyte lithium **battery cathode** containing)
REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 20 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:803861 HCAPLUS Full-text
DOCUMENT NUMBER: 141:280437
TITLE: Method of charging and discharging lithium secondary **battery**
INVENTOR(S): Tamura, Noriyuki; Kamino, Maruo; Fujitani, Shin
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 6 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2004191609 | A1 | 20040930 | US 2004-807378 | 20040324 |

JP 2004296096 A 20041021 JP 2003-82622 20030325
PRIORITY APPLN. INFO.: JP 2003-82622 A 20030325

ED Entered STN: 01 Oct 2004
AB The invention concerns a method of charging and discharging a lithium secondary **battery** in which a **neg. electrode** comprises an active material including **silicon** provided on a **current collector** which is a metal which does not form an alloy with lithium. The method is characterized in that the lithium secondary **battery** is charged and discharged within a range of state of charge at which no peak corresponding to a compound of lithium and **silicon** is observed in an X-ray diffraction pattern during charging using CuKα-radiation as the X-ray source.
IT **7440-50-8, Copper,** uses
(**current collector;** method of charging and discharging lithium secondary **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **7440-21-3, Silicon,** uses
(method of charging and discharging lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M010-44
ICS H01M004-58; H01M004-66
INCL 429050000; 429231950; 429245000
CC 52-2 (**Electrochemical,** Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST lithium secondary **battery** charging discharging method
IT **Secondary batteries**
(lithium; method of charging and discharging lithium secondary **battery**)
IT **Battery anodes**
(method of charging and discharging lithium secondary **battery**)
IT Intermetallic compounds
(method of charging and discharging lithium secondary **battery**)
IT **Copper** alloy, base
(method of charging and discharging lithium secondary **battery**)
IT **7440-50-8, Copper,** uses
(**current collector;** method of charging and discharging lithium secondary **battery**)
IT **7440-21-3, Silicon,** uses 55575-96-7, Lithium silicide Li13Si4

(method of charging and discharging lithium secondary **battery**)

L51 ANSWER 21 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:796475 HCAPLUS Full-text
DOCUMENT NUMBER: 141:263472
TITLE: **Anode** for rechargeable lithium **battery** and method for fabrication thereof
INVENTOR(S): Fukui, Atsushi; Torimae, Mariko; Kusumoto, Yasayuki; Tarui, Hisaki
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1463133 | A2 | 20040929 | EP 2004-7333 | 20040326 |
| EP 1463133 | A3 | 20070117 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK | | | | |
| JP 2004296386 | A | 20041021 | JP 2003-90502 | 20030328 |
| CN 1534813 | A | 20041006 | CN 2004-10007856 | 20040303 |
| US 2004191631 | A1 | 20040930 | US 2004-809848 | 20040326 |
| KR 2004086590 | A | 20041011 | KR 2004-20955 | 20040327 |
| PRIORITY APPLN. INFO.: | | | JP 2003-90502 A | 20030328 |

ED Entered STN: 30 Sep 2004
AB The invention concerns a **neg. electrode** for a rechargeable lithium **battery** which is obtained by sintering under a non-oxidizing atmospheric, in the form of a layer on a surface of a metal foil **current collector**, an **anode** mix containing a binder and particles of active material containing **silicon** and/or a **silicon** alloy; the **neg. electrode** being characterized in that the metal foil **current collector** has projections and recesses on its surface, the projection is shaped to have a recurved side face portion that curves more outwardly as it extends closer to a distal end of the projection, and the binder penetrates into spaces defined by the recurved side face portions.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-70
ICS H01M004-64; H01M004-02
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **anode** rechargeable lithium **battery**
IT **Battery anodes**
Surface roughness
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT Polyimides, uses
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT **Secondary batteries**
(lithium; **anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT **Electrodeposition**
(surface roughening; **anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT **Silicon** alloy, base
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT 96-49-1, Ethylene **carbonate** 105-58-8, Diethyl **carbonate** 7429-90-5, Aluminum, uses **7440-21-3**, **Silicon**, uses **7440-50-8**, **Copper**, uses 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)
IT 872-36-6, Vinylene **carbonate**
(**anode** for rechargeable lithium **battery** and method for fabrication thereof)

L51 ANSWER 22 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:412652 HCAPLUS Full-text
DOCUMENT NUMBER: 140:378137
TITLE: Preparation of solid electrolyte for lithium rechargeable **batteries**
INVENTOR(S): Shibano, Yasuyuki; Iwamoto, Kazuya
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2004096745 | A1 | 20040520 | US 2003-702491 | | 20031107 |
| JP 2004179158 | A | 20040624 | JP 2003-381940 | | 20031112 |
| PRIORITY APPLN. INFO.: | | | JP 2002-328476 | A | 20021112 |

ED Entered STN: 21 May 2004
AB A lithium ion conductor is prepared having the general formula LiaNbbTacOdNe where $0.1 \leq a \leq 2.5$, $0 \leq b < 1$, $0 < c \leq 1$, $b+c=1$, $0.1 \leq d \leq 5$, and $0.1 \leq e \leq 2$. The prepared

lithium ion conductor is used as solid electrolyte in lithium ion rechargeable **batteries**.

IT **7440-21-3, Silicon**, uses
(base plate, **electrode**; preparation of solid electrolyte for lithium rechargeable **batteries**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IT **7440-50-8, Copper**, uses
(**neg. electrode current collector**; preparation of solid electrolyte for lithium rechargeable **batteries**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **7631-86-9**, Silica, uses
(preparation of solid electrolyte for lithium rechargeable **batteries**)
RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)

O=Si=O

IC ICM C01B021-20
INCL 429322000; 423385000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery** solid electrolyte oxide nitride
IT **Secondary batteries**
(lithium; preparation of solid electrolyte for lithium rechargeable **batteries**)
IT **7440-21-3, Silicon**, uses
(base plate, **electrode**; preparation of solid electrolyte for lithium rechargeable **batteries**)
IT 1314-62-1, Vanadium pentoxide, uses 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 12022-46-7, Iron lithium oxide felio2 12031-65-1, Lithium nickel oxide linio2 12031-95-7, Lithium titanium oxide li4ti5o12 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 13824-63-0, Cobalt lithium phosphate 15365-14-7, Iron lithium phosphate felipo4 372075-87-1, Iron lithium fluoride phosphate felifpo4 433708-99-7, Cobalt lithium fluoride phosphate colifpo4 685528-73-8, Cobalt lithium nitride oxide (Co2.6LiNO0.4)
(**electrode**; preparation of solid electrolyte for lithium

rechargeable **batteries**)

IT **7440-50-8, Copper**, uses
(**neg. electrode current collector**; preparation of solid electrolyte for lithium rechargeable **batteries**)

IT 7440-06-4, Platinum, uses
(pos. **electrode current collector**; preparation of solid electrolyte for lithium rechargeable **batteries**)

IT **7631-86-9**, Silica, uses
(preparation of solid electrolyte for lithium rechargeable **batteries**)

IT 7727-37-9P, Nitrogen, uses 12031-63-9P, Lithium niobium oxide linbo3 12031-66-2P, Lithium tantalum oxide litao3
(preparation of solid electrolyte for lithium rechargeable **batteries**)

IT 685528-55-6P, Lithium tantalum nitride oxide (Li0.75TaN0.5O2.1) 685528-56-7P, Lithium niobium tantalum nitride oxide (Li0.8Nb0.1Ta0.9N0.55O2.1) 685528-57-8P, Lithium niobium tantalum nitride oxide (Li0.76Nb0.19Ta0.81N0.53O2.1) 685528-58-9P, Lithium niobium tantalum nitride oxide (Li0.85Nb0.33Ta0.67N0.49O2.2) 685528-59-0P, Lithium niobium tantalum nitride oxide (Li0.77Nb0.39Ta0.61N0.51O2.1) 685528-60-3P, Lithium niobium tantalum nitride oxide (Li0.69Nb0.53Ta0.47N0.52O2.1) 685528-61-4P, Lithium niobium tantalum nitride oxide (Li0.6Nb0.6Ta0.4N0.53O2) 685528-62-5P, Lithium niobium tantalum nitride oxide (Li0.67Nb0.71Ta0.29N0.54O2) 685528-63-6P, Lithium niobium tantalum nitride oxide (Li0.72Nb0.82Ta0.18N0.6O2) 685528-64-7P, Lithium niobium tantalum nitride oxide (Li0.77Nb0.89Ta0.11N0.67O1.9) 685528-65-8P, Lithium niobium tantalum nitride oxide (Li0.8Nb0.95Ta0.05N0.66O1.9) 685528-66-9P, Lithium niobium nitride oxide (Li0.91NbN0.61O2) 685528-67-0P, Lithium niobium tantalum nitride oxide (Li0.68Nb0.71Ta0.29N0.06O2.8) 685528-68-1P, Lithium niobium tantalum nitride oxide (Li0.68Nb0.71Ta0.29N0.12O2.7) 685528-69-2P, Lithium niobium tantalum nitride oxide (Li0.7Nb0.82Ta0.18N0.36O2.3) 685528-70-5P, Lithium niobium tantalum nitride oxide (Li0.75Nb0.89Ta0.11N0.82O1.6) 685528-71-6P, Lithium niobium tantalum nitride oxide (Li0.79Nb0.95Ta0.05N1.1O1.2) 685528-72-7P, Lithium niobium tantalum nitride oxide (Li0.85Nb0.75Ta0.25N1.5O0.7)
(preparation of solid electrolyte for lithium rechargeable **batteries**)

L51 ANSWER 23 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:269718 HCAPLUS Full-text
DOCUMENT NUMBER: 140:273626
TITLE: Method of fabrication of **anode** for lithium secondary **battery**
INVENTOR(S): Fukui, Atsushi; Kusumoto, Yasuyuki; Torimae, Mariko; Tarui, Hisaki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| US 2004062991 | A1 | 20040401 | US 2003-673348 | 20030930 |
| JP 2004127535 | A | 20040422 | JP 2002-285742 | 20020930 |
| PRIORITY APPLN. INFO.: | | | JP 2002-285742 A | 20020930 |

ED Entered STN: 02 Apr 2004

AB The invention concerns a **neg. electrode** for a lithium secondary **battery** obtained by sintering an active material layer on a **current collector** under a non-oxidizing atmospheric after the active material layer including primary particles of an active material containing **silicon** and/or a **silicon** alloy and a binder is formed on an elec. conductive metal foil as a **current collector**. A mean diameter of primary particles of the active material is less than 1 μm, the primary particles are dispersed uniformly in the active material layer, and the primary particles and the binder are uniformly mixed and distributed.

IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(method of fabrication of **anode** for lithium secondary **battery**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-58
ICS H01M004-66; H01M004-62; B05D003-02

INCL 429218100; 429231950; 429245000; 429217000; 427201000; 427397700

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST **anode** fabrication lithium secondary **battery**

IT Polyimides, uses
(binder; method of fabrication of **anode** for lithium secondary **battery**)

IT **Secondary batteries**
(lithium; method of fabrication of **anode** for lithium secondary **battery**)

IT **Battery anodes**
Sintering
(method of fabrication of **anode** for lithium secondary **battery**)

IT **Copper** alloy, base
**Silicon** alloy, base
(method of fabrication of **anode** for lithium secondary **battery**)

IT 96-49-1, Ethylene **carbonate 7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
21324-40-3, Lithium hexafluorophosphate
(method of fabrication of **anode** for lithium secondary **battery**)

IT 12190-79-3P, Cobalt lithium oxide colio2
(method of fabrication of **anode** for lithium secondary **battery**)

L51 ANSWER 24 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:1007683 HCAPLUS Full-text
DOCUMENT NUMBER: 140:44753
TITLE: **Anode** for lithium secondary **battery**
INVENTOR(S): Fukui, Atsushi; Kusumoto, Yasuyuki; Torimae, Mariko; Nakamura, Hiroshi
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 10 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| US 2003235762 | A1 | 20031225 | US 2003-463438 | 20030618 |
| US 7141334 | B2 | 20061128 | | |
| JP 2004022433 | A | 20040122 | JP 2002-178165 | 20020619 |
| PRIORITY APPLN. INFO.: | | | JP 2002-178165 A | 20020619 |

ED Entered STN: 28 Dec 2003
AB The invention concerns a **neg. electrode** for a lithium secondary **battery** obtained by providing an active material layer containing particles of an active material and a binder on a surface of a **current collector** which is an elec. conductive metal foil, and sintering the layer under a non-oxidizing atmospheric; wherein the mean diameter of the particles of the active material is not smaller than 1 μm and not greater than 10 μm, and the particle size distribution of the particles is such that at least 60 volume% of the particles are in a range of not smaller than 1 μm and not greater than 10 μm.
IT **7440-21-3, Silicon**, uses
(**anode** for lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IT **7440-50-8, Copper**, uses
(**current collector**; **anode** for lithium secondary **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-58

ICS H01M004-62; H01M004-66
INCL 429231950; X42-924.5; X42-921.7
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** lithium secondary **battery**
IT **Battery anodes**
Particle size distribution
(**anode** for lithium secondary **battery**)
IT Fluoropolymers, uses
Polyimides, uses
(binder; **anode** for lithium secondary **battery**)
IT **Secondary batteries**
(lithium; **anode** for lithium secondary **battery**)
IT **Silicon** alloy, base
(**anode** for lithium secondary **battery**)
IT **Copper** alloy, base
(**current collector**; **anode** for lithium secondary **battery**)
IT 872-36-6, Vinylene **carbonate** **7440-21-3**, **Silicon**, uses 12190-79-3, Cobalt lithium oxide colio2
(**anode** for lithium secondary **battery**)
IT 24937-79-9, Pvdf
(binder; **anode** for lithium secondary **battery**)
IT **7440-50-8**, **Copper**, uses
(**current collector**; **anode** for lithium secondary **battery**)
IT 7440-22-4, Silver, uses
(powder; **anode** for lithium secondary **battery**)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 25 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:989971 HCAPLUS Full-text
DOCUMENT NUMBER: 140:29518
TITLE: All solid state **battery**
INVENTOR(S): Iwamoto, Kazuya; Ito, Shuji
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| US 2003232248 | A1 | 20031218 | US 2003-458372 | | 20030611 |
| US 7083877 | B2 | 20060801 | | | |
| JP 2004022250 | A | 20040122 | JP 2002-173349 | | 20020613 |
| CN 1471187 | A | 20040128 | CN 2003-143034 | | 20030613 |
| PRIORITY APPLN. INFO.: | | | JP 2002-173349 | A | 20020613 |

ED Entered STN: 19 Dec 2003
AB An all solid state **battery** comprises: (a) a pos. **electrode current collector** layer, (b) a pos. **electrode** active material layer carried on the pos. **electrode current collector** layer, (c) a **neg. electrode current collector** layer, (d) a **neg. electrode** active material layer carried on the **neg. electrode current collector** layer, (e) a solid electrolyte layer interposed between the pos. and **neg. electrode** active material layers, and (f) a

substrate carrying either of the pos. and **neg. electrode current collector** layers, the substrate comprising a metal sheet and a coating layer covering the surface of the metal sheet, the coating layer comprising at least one metal nitride layer.

IT **7440-50-8, Copper**, uses
(all solid state **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **13759-10-9, Silicon** sulfide sis2
(glass; all solid state **battery**)
RN 13759-10-9 HCAPLUS
CN Silicon sulfide (SiS2) (CA INDEX NAME)

S=Si=S

IT **7631-86-9**, Silica, uses **11105-01-4, Silicon** oxynitride **12033-89-5, Silicon** nitride, uses
(layer; all solid state **battery**)
RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)

O=Si=O

RN 11105-01-4 HCAPLUS
CN Silicon nitride oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | x | 17778-88-0 |
| O | x | 17778-80-2 |
| Si | x | 7440-21-3 |

RN 12033-89-5 HCAPLUS
CN Silicon nitride (Si3N4) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IC ICM H01M004-66
INCL 429233000; 429245000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **battery** all solid state
IT Nitrides
Oxides (inorganic), uses
Oxynitrides

(layer; all solid state **battery**)
IT Magnetron sputtering
(radio-frequency; all solid state **battery**)
IT Primary **batteries**
(solid-state; all solid state **battery**)
IT **Copper** alloy, base
Iron alloy, base
Nickel alloy, base
(all solid state **battery**)
IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses **7440-50-8, Copper**, uses 12597-68-1, Stainless steel, uses 52627-24-4, Cobalt lithium oxide
(all solid state **battery**)
IT 10377-52-3, Lithium phosphate 12136-58-2, Lithium sulfide (Li2S) **13759-10-9, Silicon** sulfide sis2
(glass; all solid state **battery**)
IT 1304-56-9, Beryllium oxide, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses **7631-86-9**, Silica, uses 10043-11-5, Boron nitride, uses **11105-01-4, Silicon** oxynitride 11116-16-8, Titanium nitride **12033-89-5, Silicon** nitride, uses 12633-97-5, Aluminum oxynitride 13463-67-7, Titanium oxide, uses 24304-00-5, Aluminum nitride 37311-45-8, Zirconium oxynitride 119173-61-4, Zirconium nitride
(layer; all solid state **battery**)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 26 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:677121 HCAPLUS Full-text
DOCUMENT NUMBER: 139:397872
TITLE: Structured **negative electrodes** for NiMH cells
AUTHOR(S): Whitehead, Adam H.; Harrer, Martin; Schreiber, Martha
CORPORATE SOURCE: Funktionswerkstoffe F and E GmbH Technologiezentrum, Eisenstadt, A-7000, Austria
SOURCE: Proceedings - Electrochemical Society (2003), 2001-21(Batteries and Supercapacitors), 648-652
CODEN: PESODO; ISSN: 0161-6374
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 29 Aug 2003
AB At present com. NiMH **batteries** employ **anodes** which typically consist of alloy powders bonded to fairly rigid perforated metal foils. NiMH **anodes** were prepared from a standard metal alloy but formed into a novel **electrode** structure. A flexible, woven, metalized polymeric **current collector** was used together with various polymeric binders. The **electrode** performance was studied by cyclic voltammetry and impedance measurements. Galvanostatic cycling was used to study **electrode** stability as a function of the binder and addnl. components. **Silicones** differed widely in their stability in the electrolyte. Inclusion of fine graphite powder and a **Cu** macroencapsulation layer significantly improved **electrode** capacity and cycling stability.
IT **7440-50-8, Copper**, uses
(**anode** containing; structured **anodes** for nickel-metal hydride **batteries** with)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** nickel metal hydride **battery** binder graphite **copper** macroencapsulation
IT **Silicone** rubber, uses
(Elastosil A 07, Elastosil N 10, **anode** binder; structured **anodes** for nickel-metal hydride **batteries**)
IT Polyurethanes, uses
(**anode** binder; structured **anodes** for nickel-metal hydride **batteries**)
IT **Battery anodes**
**Secondary batteries**
(structured **anodes** for nickel-metal hydride **batteries**)
IT 8049-20-5, Misch metal
(alloy, **anode**; structured **anodes** for nickel-metal hydride **batteries**)
IT 626250-20-2, Terostat 9200
(**anode** binder; structured **anodes** for nickel-metal hydride **batteries**)
IT **7440-50-8, Copper**, uses 7782-42-5, Graphite, uses
(**anode** containing; structured **anodes** for nickel-metal hydride **batteries** with)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 27 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:331092 HCAPLUS Full-text
DOCUMENT NUMBER: 138:306739
TITLE: Method for electroplating of indium on **copper** nail used as **negative electrode current collector** of mercury-free alkali Zn-Mn **battery**
INVENTOR(S): Li, Weishan; Huang, Qiming; Lu, Dongsheng
PATENT ASSIGNEE(S): South-China Normal Univ., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| CN 1348224 | A | 20020508 | CN 2001-129898 | 20011109 |
| PRIORITY APPLN. INFO.: | | | CN 2001-129898 | 20011109 |

ED Entered STN: 01 May 2003
AB The method comprises: (1) degreasing at 20-40°C for 10-20 min in an aqueous solution containing Na2CO4 2-4, Na3PO4.12H2O 1-3, Na2SiO3 0.5-1, OP 0.2-0.3, and Na dodecyl sulfate 0.005-0.015%, (2) chemical polishing at 10-40°C for 30-60 s in an aqueous solution containing H2SO4 30-60, NaNO3 5-10, NaCl 0.2-1,

urea 4-6, and polyethylene glycol 0.1-0.2%, (3) vibrational electroplating of In with In or graphite as **anode** at 10-40°C, **cathodic** c.d. 1-10 A/cm2, and 2-5 V for 5-20 min in an solution, pH 2-4, containing InCl3 2-5, NaCl 2-8, additive A (such as hydroquinone, resorcin, 1- naphthalenol) 0.1-0.5, and additive B (such as arabic gum, gelatin) 0.001-0.01%; and (4) vibrational polishing.

IT **7440-50-8, Copper**, uses
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

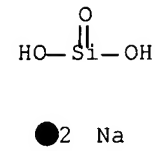
RN 7440-50-8 HCAPLUS

CN Copper (CA INDEX NAME)


IT **6834-92-0**
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

RN 6834-92-0 HCAPLUS

CN Silicic acid (H2SiO3), sodium salt (1:2) (CA INDEX NAME)




IC ICM H01M004-04
ICS H01M004-64; C25D003-00; C25D005-00

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**

ST indium electroplating **copper** nail **current collector** alkali **battery cathode**

IT Polishing
(chemical; method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT **Battery cathodes**
Degreasing
**Electrodeposition**
Polishing
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT Polyoxyalkylenes, uses
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT 7440-74-6, Indium, uses

(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT 10025-82-8, Indium chloride
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT **7440-50-8, Copper**, uses
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

IT 57-13-6, Urea, uses 90-15-3, 1-Naphthalenol 108-46-3, Resorcin, uses 123-31-9, Hydroquinone, uses 151-21-3, Sodium dodecyl sulfate, uses 497-19-8, Sodium **carbonate**, uses **6834-92-0** 7601-54-9, Sodium phosphate 7631-99-4, Sodium nitrate, uses 7647-14-5, Sodium chloride, uses 9000-01-5, Arabic gum 25322-68-3, Polyethylene glycol
(method for electroplating of indium on **copper** nail used as **neg. electrode current collector** of mercury-free alkali Zn-Mn **battery**)

L51 ANSWER 28 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:96475 HCAPLUS Full-text
DOCUMENT NUMBER: 138:109652
TITLE: **Anode** for rechargeable **battery** including lithium or lithium alloy as an active material
INVENTOR(S): Mori, Mitsuhiro; Yamamoto, Hironori; Utsugi, Koji; Iriyama, Jiro; Miura, Tamaki; Miyachi, Mariko
PATENT ASSIGNEE(S): NEC Corporation, Japan
SOURCE: Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1282179 | A2 | 20030205 | EP 2002-17241 | 20020731 |
| EP 1282179 | A3 | 20050629 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK | | | | |
| JP 2003045415 | A | 20030214 | JP 2001-232716 | 20010731 |
| US 2003036000 | A1 | 20030220 | US 2002-208962 | 20020731 |
| US 6777134 | B2 | 20040817 | | |
| CN 1400680 | A | 20030305 | CN 2002-142920 | 20020731 |
| PRIORITY APPLN. INFO.: | | | JP 2001-232716 A | 20010731 |

ED Entered STN: 07 Feb 2003
AB A **neg. electrode** for a rechargeable **battery** includes: a **current collector**, a first layer containing a conductive material to occlude and release lithium ion, the first layer formed on the **current collector**, a second layer containing a metal selected from lithium and lithium alloy, the second layer formed on the first layer, and a third layer containing a lithium ion conductive material, the third layer formed on the second layer. The third layer prevents the lithium and/or the lithium alloy in the second layer from being in contact with the electrolyte and smoothly feeds the lithium to the second layer to improve the efficiency of the **neg. electrode**. The first layer can occlude and release the part of the lithium to be occluded and released,

thereby reducing the volume change of the second layer. Such a structure of the **neg. electrode** enables us to enhance cycling efficiency, and to attain long cycle life and good safety.

IT **7440-50-8, Copper**, uses **68848-64-6**
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 68848-64-6 HCAPLUS
CN Lithium alloy, nonbase, Li,Si (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Li | 7439-93-2 |
| Si | 7440-21-3 |

IC ICM H01M004-02
ICS H01M004-36; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **anode** lithium secondary **battery**; safety
**anode** lithium secondary **battery**
IT **Battery anodes**
Conducting polymers
Evaporation
Sputtering
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Carbonaceous materials (technological products)
Polyacetylenes, uses
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Fluoropolymers, uses
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Vapor deposition process
(chemical; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Sol-gel processing
(coating; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Alkali metal halides, uses
(lithium halides; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT **Secondary batteries**
(lithium; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Coating process
(sol-gel; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT Lithium alloy, base
(**anode** for rechargeable **battery** including

lithium or lithium alloy as active material)
IT 7440-44-0, Carbon, uses 12057-24-8, Lithium oxide, uses 12136-58-2, Lithium sulfide
(amorphous; **anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT 554-13-2, Lithium **carbonate** 7439-93-2, Lithium, uses **7440-50-8, Copper**, uses 7782-42-5, Graphite, uses 7789-24-4, Lithium fluoride, uses 12798-95-7 25067-58-7, Polyacetylene 25233-34-5, Polythiophene 37347-47-0, Phosphorus sulfide p2s6 53680-59-4 **68848-64-6**
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)
IT 24937-79-9, Pvdf
(**anode** for rechargeable **battery** including lithium or lithium alloy as active material)

L51 ANSWER 29 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:734078 HCAPLUS Full-text
DOCUMENT NUMBER: 137:250311
TITLE: Lithium ion **battery** elements made from a microcomposite powder containing a filler and a fluoropolymer
INVENTOR(S): Barriere, Benoit; Bussi, Philippe
PATENT ASSIGNEE(S): ATOFINA, Fr.
SOURCE: Eur. Pat. Appl., 21 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| EP 1244161 | A1 | 20020925 | EP 2001-402465 | | 20010926 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | | |
| FR 2822296 | A1 | 20020920 | FR 2001-3673 | | 20010319 |
| CA 2378622 | A1 | 20020919 | CA 2002-2378622 | | 20020319 |
| CA 2378622 | C | 20040810 | | | |
| CN 1378298 | A | 20021106 | CN 2002-119214 | | 20020319 |
| US 2002168569 | A1 | 20021114 | US 2002-100181 | | 20020319 |
| JP 2002334721 | A | 20021122 | JP 2002-77059 | | 20020319 |
| JP 2004265874 | A | 20040924 | JP 2004-137523 | | 20040506 |
| PRIORITY APPLN. INFO.: | | | FR 2001-3673 | A | 20010319 |
| | | | JP 2002-77059 | A3 | 20020319 |

ED Entered STN: 27 Sep 2002
AB A Li ion **battery** element (e.g., separator, electroactive layers) is produced by forming of a microcomposite powder containing 20-80% fluorinated polymer in the form of particles 0.1-0.5 μm diameter and 20-80% filler. The polymer powder is a PVDF homopolymer or copolymer. The filler is SiO2, LiMxOy (M = metal), graphite, carbon black, carbon fibers, and active C. The microcomposite powder is prepared by (co)atomization, flocculation, or coagulation of an aqueous solution of the fluorinated polymer particles and an aqueous solution of the filler. Typically, a **neg. electrode** is formed by a **Cu** layer **collector** and a graphite, carbon black, carbon fiber, or active C electroactive layer. Typically, a pos. **electrode** is formed by an Al layer **collector** and a LiMxOy electroactive layer.
IT **7440-50-8, Copper**, uses

(**current collector** for **anode** in lithium ion **batteries**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **7631-86-9**, Silica, uses
(in preparation of microcomposite powder for lithium ion **battery** elements)
RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)

O=Si=O

IC ICM H01M004-62
ICS H01M004-02; H01M002-16
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium **battery** element microcomposite powder; **anode battery** microcomposite powder; **cathode battery** microcomposite powder; separator **battery** microcomposite powder
IT Fluoropolymers, uses
(in microcomposite powder for lithium ion **battery** elements)
IT Atomizing (spraying)
Coagulation
Flocculation
(in preparation of microcomposite powder for lithium ion **battery** elements)
IT Carbon black, uses
Carbon fibers, uses
(in preparation of microcomposite powder for lithium ion **battery** elements)
IT **Secondary batteries**
(lithium; microcomposite powder for lithium ion **battery** elements)
IT **Battery anodes**
**Battery cathodes**
(microcomposite powder for lithium ion **battery** elements)
IT **Secondary battery separators**
(secondary; microcomposite powder for lithium ion **battery** elements)
IT 7440-44-0, Carbon, uses
(active; in preparation of microcomposite powder for lithium ion **battery** elements)
IT **7440-50-8, Copper**, uses
(**current collector** for **anode** in lithium ion **batteries**)
IT 7429-90-5, Aluminum, uses
(**current collector** for **cathode** in

lithium ion **batteries**)
IT 210823-71-5, Coadis 123k
(dispersant in preparation of microcomposite powder for lithium ion **battery** elements)
IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
24937-79-9, PVDF
(in microcomposite powder for lithium ion **battery** elements)
IT 7439-93-2D, Lithium, intercalation compound with metal oxide
**7631-86-9**, Silica, uses 7782-42-5, Graphite, uses
(in preparation of microcomposite powder for lithium ion **battery** elements)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 30 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:585692 HCAPLUS Full-text
DOCUMENT NUMBER: 137:111643
TITLE: Method for manufacture of gel polymer electrolyte separator for laminated lithium ion **batteries**
INVENTOR(S): Lin, Yunqing; Ge, Shao; Sun, Shuhua
PATENT ASSIGNEE(S): Jida Chaoyue S & T Development Co., Ltd., Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 12 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| CN 1310483 | A | 20010829 | CN 2001-108824 | 20010220 |
| PRIORITY APPLN. INFO.: | | | CN 2001-108824 A | 20010220 |
| | | | CN 2001-106067 | 20010109 |

ED Entered STN: 07 Aug 2002
AB The separator, 25-80 Φmm thick, is manufactured by dissolving hexafluoropropylene-vinylidene fluoride copolymer and plasticizer such as DBP in an organic solvent at 50°C, adding inorg. filler (nanometer SiO2, pretreated with dispersing agent) in forms of slurry of acetone or butanone to the polymer solution, cooling to 30°C, and forming a film by coating. The pos. **electrode** film is manufactured by preparing a slurry containing LiCoO2 (or LiNiO2, LiMn2O4), acetylene black, hexafluoropropylene-vinylidene fluoride copolymer, DBP, and a dispersing agent, coating the slurry on a glass strip or a metal foil, and drying at 30- 60°C. The **neg. electrode** film is manufactured by preparing a slurry containing carbonaceous material (MCMB) powder, acetylene black, hexafluoropropylene-vinylidene fluoride copolymer, DBP, and a dispersing agent (e.g., OP-10), coating the slurry on a glass strip or a metal foil, and drying at 30-60°C. The laminated **battery** is manufactured by laminating an Al network (pos. **current collector**), the pos. **electrode** film, the separator, the **neg. electrode** film, and a **Cu** network by hot pressing at 130-135°C to form a **battery** unit, making a stack of the **battery** units, hot pressing, removing DBP with a petroleum ether having a b.p. 90- 120°C or methanol, drying, and introducing an liquid electrolyte into the **battery** stack.

IT **7631-86-9**, Silica, uses
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)



IT **7440-50-8**, **Copper**, uses
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)



IC ICM H01M002-14
ICS H01M002-16; H01M010-38
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **battery** gel polymer electrolyte separator **electrode** film
IT **Battery anodes**
**Battery cathodes**
Films
**Secondary battery separators**
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
IT Carbon black, uses
Carbonaceous materials (technological products)
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
IT **7631-86-9**, Silica, uses 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (LiCoO2)
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
IT 84-74-2, DBP
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
IT 7429-90-5, Aluminum, uses **7440-50-8**, **Copper**, uses
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)
IT 153301-99-6, OP 10
(gel polymer electrolyte separator and **electrode** films for laminated lithium ion **batteries**)

L51 ANSWER 31 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:391427 HCAPLUS Full-text
DOCUMENT NUMBER: 136:372303

TITLE: Double **current collector** **anode** design for alkali metal ion electrochemical cells
INVENTOR(S): Gan, Hong; Rubino, Robert S.; Takeuchi, Esther S.
PATENT ASSIGNEE(S): Wilson Greatbatch Ltd., USA
SOURCE: Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 6
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1207571 | A2 | 20020522 | EP 2001-127533 | 20011118 |
| EP 1207571 | A3 | 20050824 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| US 2002061446 | A1 | 20020523 | US 2001-8977 | 20011108 |
| US 6737191 | B2 | 20040518 | | |
| JP 2002198061 | A | 20020712 | JP 2001-349778 | 20011115 |
| CA 2363162 | A1 | 20020517 | CA 2001-2363162 | 20011116 |
| JP 2002198035 | A | 20020712 | JP 2001-351632 | 20011116 |
| JP 2002203607 | A | 20020719 | JP 2001-351633 | 20011116 |
| JP 2002237334 | A | 20020823 | JP 2001-390626 | 20011116 |
| JP 2002270162 | A | 20020920 | JP 2001-390625 | 20011116 |
| JP 2002237310 | A | 20020823 | JP 2001-395430 | 20011119 |

PRIORITY APPLN. INFO.: US 2000-249688P P 20001117
US 2001-8977 A 20011108

ED Entered STN: 24 May 2002
AB A new sandwich **neg. electrode** design for a secondary cell is provided comprising a "sacrificial" alkali metal along with a carbonaceous **anode** material. In the case of a hard carbon **anode** material, the sacrificial alkali metal is preferably lithium and is sized to compensate for the initial irreversible capacity of this **anode** material. Upon activating the cells, the lithium metal automatically intercalates into the hard carbon **anode** material. That way, the sacrificial lithium is consumed and compensates for the generally unacceptable irreversible capacity of hard carbon. The superior cycling longevity of hard carbon now provides a secondary cell of extended use beyond that known for conventional secondary cells having only graphitic **anode** materials.
IT **7440-50-8, Copper,** uses
(**current collector;** double **current collector anode** design for alkali metal ion electrochem. cells)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **113443-18-8, Silicon** oxide SiO
(double **current collector anode** design for alkali metal ion electrochem. cells)
RN 113443-18-8 HCAPLUS

CN Silicon oxide (SiO) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

IC ICM H01M004-02
ICS H01M004-36; H01M004-66; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 63
ST **battery** double **current collector** **anode** design; implantable medical device **battery** **anode** design
IT **Battery anodes**
**Secondary batteries**
(double **current collector anode** design for alkali metal ion electrochem. cells)
IT Alkali metals, uses
Alkaline earth metals
Carbon black, uses
Carbonaceous materials (technological products)
Coke
Group IIIB elements
(double **current collector anode** design for alkali metal ion electrochem. cells)
IT Medical goods
(implantable; double **current collector** **anode** design for alkali metal ion electrochem. cells)
IT Borate glasses
Phosphate glasses
(tin borophosphate; double **current collector** **anode** design for alkali metal ion electrochem. cells)
IT 7440-06-4, Platinum, uses 7440-25-7, Tantalum, uses **7440-50-8, Copper**, uses 7440-57-5, Gold, uses 11101-13-6
(**current collector**; double **current** **collector anode** design for alkali metal ion electrochem. cells)
IT 67-68-5, Dmso, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, γ-Butyrolactone 96-49-1, Ethylene **carbonate** 105-58-8, DiEthyl **carbonate** 108-29-2, γ-Valerolactone 108-32-7, Propylene **carbonate** 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 111-96-6, Diglyme 112-49-2, Triglyme 127-19-5, Dimethyl acetamide 143-24-8, Tetraglyme 556-65-0, Lithium thiocyanate 616-38-6, Dimethyl **carbonate** 623-53-0, Ethyl methyl **carbonate** 623-96-1, Dipropyl **carbonate** 629-14-1, 1,2-Diethoxyethane 872-50-4, uses 1313-13-9, Manganese dioxide, uses 1314-62-1, Vanadium pentoxide, uses 1317-37-9, Iron sulfide fes 1344-70-3, **Copper** oxide 2923-17-3 5137-45-1, 1-Ethoxy-2-methoxyethane 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 7784-01-2, Silver chromate 7791-03-9, Lithium perchlorate 11105-02-5, Silver vanadium oxide 12019-06-6, **Copper** dioxide 12031-65-1, Lithium nickel oxide linio2 12039-13-3, Titanium sulfide (TiS2) 12057-17-9, Lithium manganese oxide limn2o4 12057-24-8, Lithia, uses 12068-85-8, Iron sulfide fes2 12162-79-7,

Lithium manganese oxide limno2 12162-92-4, Lithium vanadium oxide liv2o5 12190-79-3, Cobalt lithium oxide colio2 12789-09-2, **Copper** vanadium oxide 13453-75-3, Fluorosulfuric acid, lithium salt 13478-41-6, **Copper** fluoride Cuf 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18282-10-5, Tin dioxide 18424-17-4, Lithium hexafluoroantimonate 20667-12-3, Silver oxide ag2o 21324-40-3, Lithium hexafluorophosphate 21651-19-4, Tin monoxide 22205-45-4, **Copper** sulfide cu2s 25455-73-6, Silver oxide ag2o2 29935-35-1, Lithium hexafluoroarsenate 33454-82-9 35363-40-7, Ethyl propyl **carbonate**, uses 51311-17-2, Carbon fluoride 56525-42-9, Methyl propyl **carbonate**, uses 90076-65-6 **113443-18-8**, **Silicon** oxide SiO 115028-88-1 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 181183-66-4, **Copper** silver vanadium oxide 188029-35-8, Lithium titanium oxide Li4-7Ti5O12 256650-80-3, Cobalt lithium tin oxide Co0.92LiSn0.08O2 423734-10-5, Cobalt lithium nitride (Co0.1-0.6Li2.4-2.9N) 423734-14-9, Lithium nickel nitride (Li2.4-2.9Ni0.1-0.6N)
(double **current collector anode** design for alkali metal ion electrochem. cells)

IT 12597-68-1, Stainless steel, uses
(double **current collector anode** design for alkali metal ion electrochem. cells)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses
(powder; double **current collector anode** design for alkali metal ion electrochem. cells)

L51 ANSWER 32 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:114891 HCAPLUS Full-text
DOCUMENT NUMBER: 134:134156
TITLE: Nonaqueous electrolyte secondary **battery**
INVENTOR(S): Kohno, Tatsuoki; Takami, Norio; Inagaki, Hiroki; Morita, Tomokazu; Takeno, Shirou
PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
SOURCE: Eur. Pat. Appl., 25 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | | DATE |
|---|---|---|---|---|---|
| EP 1076373 | A2 | 20010214 | EP 2000-306779 | | 20000809 |
| EP 1076373 | A3 | 20020703 | | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | | |
| JP 2001052691 | A | 20010223 | JP 1999-225489 | | 19990809 |
| JP 2001185150 | A | 20010706 | JP 1999-374989 | | 19991228 |
| US 6495291 | B1 | 20021217 | US 2000-634641 | | 20000808 |
| PRIORITY APPLN. INFO.: | | | JP 1999-225489 | A | 19990809 |
| | | | JP 1999-374989 | A | 19991228 |

ED Entered STN: 15 Feb 2001
AB A nonaq. electrolyte secondary **battery** comprises a nonaq. electrolyte, a pos. **electrode**, and a **neg**. **electrode** containing a **neg**. **electrode** active material,

wherein the **neg. electrode** active material contains a composite material having a microstructure containing a carbon-containing phase and a crystal phase having an average size falling within a range of between 0.01 μm and 10 μm.

IT **7440-50-8, Copper**, uses
(**current collector**; nonaq. electrolyte secondary **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **7440-21-3, Silicon**, uses
(nonaq. electrolyte secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST **battery** secondary nonaq electrolyte
IT Fluoropolymers, uses
(binder; nonaq. electrolyte secondary **battery**)
IT **Battery anodes**
**Battery** electrolytes
**Secondary batteries**
(nonaq. electrolyte secondary **battery**)
IT Carbon black, uses
(nonaq. electrolyte secondary **battery**)
IT 24937-79-9, Pvdf
(binder; nonaq. electrolyte secondary **battery**)
IT **7440-50-8, Copper**, uses
(**current collector**; nonaq. electrolyte secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 623-53-0, Ethyl methyl **carbonate** 7429-90-5, Aluminum, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-03-1, Niobium, uses **7440-21-3, Silicon**, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 9002-88-4, Polyethylene 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate
(nonaq. electrolyte secondary **battery**)

IT 7782-42-5, Graphite, uses
(nonaq. electrolyte secondary **battery**)
IT 872-50-4, n-Methylpyrrolidone, uses
(nonaq. electrolyte secondary **battery**)

L51 ANSWER 33 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:885117 HCAPLUS Full-text
DOCUMENT NUMBER: 134:165539
TITLE: Metal-graphite as **negative electrode** for Li-ion **batteries**
AUTHOR(S): Zaghib, Karim; Nadeau, Gabrielle; Guerfi, Abdelbast; Brochu, Fernand
CORPORATE SOURCE: Institut de Recherche d'Hydro-Quebec, Varennes, QC, J3X 1S1, Can.
SOURCE: ITE Letters on Batteries, New Technologies & Medicine (2000), 1(5), 727-737
CODEN: ILBMF9
PUBLISHER: ITE-IBA Publication Office
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 18 Dec 2000
AB Electrochem. intercalation-deintercalation reactions, which occur in a metal-supported carbon **anode**, were investigated using slow cyclic voltammetry and galvanostatic measurements. The effect of metals (e.g. Ag, Sn, Al, **Cu**, Si, Mo, Fe) on the performance of LiC6 **electrodes** were studied as well as the mechanism of hybrid reactions, namely intercalation, alloying and the catalytic effect of metals on the formation and properties of the SEI. The results show that in the slow scan voltammetry of virgin graphite, graphite + Ag and graphite + Sn, these **electrodes** have the same OCV, i.e. 3.1 V. During the reduction, NG + Sn has one peak at 1.27 V due to the reduction of SnOx to metallic Sn. However, these three **electrodes** show the same peak at 710 mV due to the formation of a passivation layer; natural graphite (NG) has a low irreversible capacity. The addition of metal has a big effect on the formation of a passivation layer, perhaps also on its electronic conductivity Expanded metal as the **current collector** increases the adhesion and give more practical metal graphite as an **anode** for Li-ion **batteries**. The Ag supported graphite is highly promising from a safety perspective, especially near the OV.
IT **7440-21-3, Silicon**, uses **7440-50-8, Copper**, uses
(metal-graphite as **neg. electrode** for Li-ion **batteries**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium **battery** metal graphite **electrode**
IT **Secondary batteries**
(lithium; metal-graphite as **neg. electrode** for Li-ion **batteries**)
IT **Battery anodes**
(metal-graphite as **neg. electrode** for Li-ion **batteries**)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses **7440-21-3**, **Silicon**, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses **7440-50-8**, **Copper**, uses 7782-42-5, Graphite, uses
(metal-graphite as **neg. electrode** for Li-ion **batteries**)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 34 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:608507 HCAPLUS Full-text
DOCUMENT NUMBER: 133:196015
TITLE: **Anode**-active material used in lithium secondary **battery**
INVENTOR(S): Kaneda, Junya; Takeuchi, Seiji; Watanabe, Noriyuki; Yamaki, Takahiro; Muranaka, Yasushi; Aono, Yasuhisa
PATENT ASSIGNEE(S): Hitachi, Ltd., Japan
SOURCE: Eur. Pat. Appl., 32 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1032062 | A1 | 20000830 | EP 2000-102256 | 20000215 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| JP 2000243396 | A | 20000908 | JP 1999-44119 | 19990223 |
| US 2003129494 | A1 | 20030710 | US 2000-505203 | 20000216 |
| US 6638662 | B2 | 20031028 | | |
| KR 2000058145 | A | 20000925 | KR 2000-8567 | 20000222 |
| PRIORITY APPLN. INFO.: | | | JP 1999-44119 A | 19990223 |

ED Entered STN: 01 Sep 2000
AB A lithium secondary **battery** comprising a pos. **electrode**, a **neg. electrode** containing a lithium ion-storable/dischargeable **neg. electrode** -active material and a lithium ion conductive, nonaq. electrolytic solution or polymer electrolyte, is characterized in that the **neg** . **electrode**-active material comprises particles of carbonaceous material and particles of metal and metal oxide capable of enhancing lithium ion interstitial diffusibility/releasability as embedded in the particles of carbonaceous material. The particles of carbonaceous materials and lithium ion interstitially diffusible/releasable particles are prepared by carbonization of a mixture thereof with MA or carbon precursor. The **battery** has a high capacity and a long cycle life, and can be used in various elec. appliances.
IT **7440-21-3**, **Silicon**, uses **113443-18-8**, **Silicon** oxide (SiO)

(**anode**-active material used in lithium secondary **battery**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 113443-18-8 HCAPLUS
CN Silicon oxide (SiO) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Si | 1 | 7440-21-3 |

IT **7440-50-8, Copper**, uses
(**current collector**; **anode**-active material used in lithium secondary **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M004-58
ICS H01M010-40; C01G031-00
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium **battery anode** active material
IT **Battery anodes**
Carbonization
Petroleum pitch
(**anode**-active material used in lithium secondary **battery**)
IT Carbon fibers, uses
Carbonaceous materials (technological products)
(**anode**-active material used in lithium secondary **battery**)
IT Fluoropolymers, uses
(**anode**-active material used in lithium secondary **battery**)
IT **Secondary batteries**
(lithium; **anode**-active material used in lithium secondary **battery**)
IT 96-49-1, Ethylene **carbonate** 616-38-6, Dimethyl **carbonate** 7429-90-5, Aluminum, uses **7440-21-3, Silicon**, uses 7440-56-4, Germanium, uses 7782-42-5, Graphite, uses 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 15773-66-7, Tin silicate snsio3 18282-10-5, Tin dioxide 21324-40-3, Lithium hexafluorophosphate 113066-89-0, Cobalt lithium nickel oxide Co0.2LiNi0.8O2 **113443-18-8, Silicon** oxide (SiO)

178404-39-2, Lithium manganese oxide Li1.09Mn1.9104
(**anode**-active material used in lithium secondary **battery**)
IT 24937-79-9, Pvdf
(**anode**-active material used in lithium secondary **battery**)
IT **7440-50-8, Copper**, uses
(**current collector**; **anode**-active material used in lithium secondary **battery**)

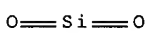
L51 ANSWER 35 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:456808 HCAPLUS Full-text
DOCUMENT NUMBER: 133:61366
TITLE: **Current collectors** for polymer rechargeable **battery**
INVENTOR(S): Yamada, Kazunori; Watanabe, Toshiaki; Kubota, Shuhei; Sugawara, Shizuo
PATENT ASSIGNEE(S): Tokai Aluminum Foil Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 1017120 | A1 | 20000705 | EP 1999-310064 | 19991214 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| JP 2000243401 | A | 20000908 | JP 1999-154194 | 19990601 |
| JP 3321432 | B2 | 20020903 | | |
| KR 2000006385 | A | 20000125 | KR 1999-23689 | 19990623 |
| CN 1258937 | A | 20000705 | CN 1999-126301 | 19991215 |
| TW 445665 | B | 20010711 | TW 1999-88122736 | 19991223 |
| US 6410189 | B1 | 20020625 | US 1999-471516 | 19991223 |
| PRIORITY APPLN. INFO.: | | | JP 1998-368625 A | 19981225 |
| | | | JP 1999-154194 A | 19990601 |
| | | | JP 1998-196712 A | 19980626 |

ED Entered STN: 07 Jul 2000
AB This invention provides a polymer rechargeable **battery**, which is obtained by integrally holding a separator, which comprises a polymer and a plasticizer, between pos. and **neg. electrodes** and then replacing the plasticizer with an electrolyte solution, and methods of making them. The pos. and **neg. electrodes** are provided with **current collectors** obtained by etching metal-foil base materials, resp. This invention also provides such **current collectors**.
IT **7440-50-8, Copper**, uses **7631-86-9**, Silica, uses
(**current collectors** for polymer rechargeable **battery**)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

RN 7631-86-9 HCAPLUS
CN Silica (CA INDEX NAME)



IC ICM H01M004-70
ICS H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST polymer **battery electrode current collector**
IT **Battery electrodes**
Honeycomb structures
**Secondary battery separators**
(**current collectors** for polymer rechargeable **battery**)
IT Polyesters, uses
(**current collectors** for polymer rechargeable **battery**)
IT Resists
(etching; **current collectors** for polymer rechargeable **battery**)
IT **Secondary batteries**
(lithium; **current collectors** for polymer rechargeable **battery**)
IT 96-49-1, Ethylene **carbonate** 616-38-6, Dimethyl **carbonate** 7429-90-5, Aluminum, uses **7440-50-8**, **Copper**, uses **7631-86-9**, Silica, uses 9011-17-0, Kynar 2801 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate
(**current collectors** for polymer rechargeable **battery**)
IT 7705-08-0, Ferric chloride, uses
(etchant; **current collectors** for polymer rechargeable **battery**)
IT 7440-44-0, Carbon, uses
(mesophase; **current collectors** for polymer rechargeable **battery**)
IT 84-74-2, Dibutyl phthalate
(plasticizer; **current collectors** for polymer rechargeable **battery**)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 36 OF 36 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:209801 HCAPLUS Full-text
DOCUMENT NUMBER: 132:224886
TITLE: Lithium-ion secondary **battery** constructed of low magnetic susceptibility materials
INVENTOR(S): Leising, Randolph A.; Takeuchi, Esther S.; Spillman, David M.

PATENT ASSIGNEE(S): Wilson Greatbatch Ltd., USA
SOURCE: Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|
| EP 989624 | A1 | 20000329 | EP 1999-307455 | 19990921 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| JP 2000100475 | A | 20000407 | JP 1999-267119 | 19990921 |

PRIORITY APPLN. INFO.: US 1998-101175P P 19980921
US 1998-211406 A 19981215

ED Entered STN: 31 Mar 2000

AB A rechargeable alkali metal electrochem. cell, and preferably a lithium-ion secondary cell, constructed of low magnetic susceptibility materials, is described. The non-magnetic characteristics enable the secondary cell to be used within the confines of a magnetic resonance imaging system. A secondary electrochem. cell wherein the length and the width of the **neg. electrode** extend beyond the length and the width of the pos. **electrode** to provide the pos. **electrode** bounded by the **neg. electrode**. The **neg. electrode** active material includes graphite with specific characteristics.

IT **7440-50-8, Copper,** uses
(**anode current collector;** lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IT **11107-04-3 11109-50-5 11134-23-9 12611-86-8**
(casing; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
RN 11107-04-3 HCAPLUS
CN Iron alloy, base, Fe 62-72,Cr 16.00-18.00,Ni 10.00-14.00,Mo 2.00-3.00,Mn 0-2.00,Si 0-1.00,C 0-0.08,P 0-0.045,S 0-0.030 (UNS S31600) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Fe | 62 - 72 | 7439-89-6 |
| Cr | 16.00 - 18.00 | 7440-47-3 |
| Ni | 10.00 - 14.00 | 7440-02-0 |
| Mo | 2.00 - 3.00 | 7439-98-7 |
| Mn | 0 - 2.00 | 7439-96-5 |
| Si | 0 - 1.00 | 7440-21-3 |
| C | 0 - 0.08 | 7440-44-0 |
| P | 0 - 0.045 | 7723-14-0 |

| | | | | |
|---|---|---|---|---|
| S | 0 | - | 0.030 | 7704-34-9 |

RN 11109-50-5 HCAPLUS
CN Iron alloy, base, Fe 66-74,Cr 18.00-20.00,Ni 8.00-10.50,Mn 0-2.00,Si 0-1.00,C 0-0.08,P 0-0.045,S 0-0.030 (UNS S30400) (CA INDEX NAME)

| Component | Component Percent | | | Component Registry Number |
|---|---|---|---|---|
| Fe | 66 | - | 74 | 7439-89-6 |
| Cr | 18.00 | - | 20.00 | 7440-47-3 |
| Ni | 8.00 | - | 10.50 | 7440-02-0 |
| Mn | 0 | - | 2.00 | 7439-96-5 |
| Si | 0 | - | 1.00 | 7440-21-3 |
| C | 0 | - | 0.08 | 7440-44-0 |
| P | 0 | - | 0.045 | 7723-14-0 |
| S | 0 | - | 0.030 | 7704-34-9 |

RN 11134-23-9 HCAPLUS
CN Iron alloy, base, Fe 62-72,Cr 16.00-18.00,Ni 10.00-14.00,Mo 2.00-3.00,Mn 0-2.00,Si 0-1.00,P 0-0.045,C 0-0.030,S 0-0.030 (UNS S31603) (CA INDEX NAME)

| Component | Component Percent | | | Component Registry Number |
|---|---|---|---|---|
| Fe | 62 | - | 72 | 7439-89-6 |
| Cr | 16.00 | - | 18.00 | 7440-47-3 |
| Ni | 10.00 | - | 14.00 | 7440-02-0 |
| Mo | 2.00 | - | 3.00 | 7439-98-7 |
| Mn | 0 | - | 2.00 | 7439-96-5 |
| Si | 0 | - | 1.00 | 7440-21-3 |
| P | 0 | - | 0.045 | 7723-14-0 |
| C | 0 | - | 0.030 | 7440-44-0 |
| S | 0 | - | 0.030 | 7704-34-9 |

RN 12611-86-8 HCAPLUS
CN Iron alloy, base, Fe 65-74,Cr 18.00-20.00,Ni 8.00-12.00,Mn 0-2.00,Si 0-1.00,P 0-0.045,C 0-0.030,S 0-0.030 (UNS S30403) (CA INDEX NAME)

| Component | Component Percent | | | Component Registry Number |
|---|---|---|---|---|
| Fe | 65 | - | 74 | 7439-89-6 |
| Cr | 18.00 | - | 20.00 | 7440-47-3 |
| Ni | 8.00 | - | 12.00 | 7440-02-0 |
| Mn | 0 | - | 2.00 | 7439-96-5 |
| Si | 0 | - | 1.00 | 7440-21-3 |
| P | 0 | - | 0.045 | 7723-14-0 |
| S | 0 | - | 0.030 | 7704-34-9 |
| C | 0 | - | 0.03 | 7440-44-0 |

IT **7440-50-8D, Copper**, chalcogenides, lithiated, uses
(lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
RN 7440-50-8 HCAPLUS
CN Copper (CA INDEX NAME)

Cu

IC ICM H01M010-40
ICS H01M002-02; H01M004-58
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
ST lithium **battery** low magnetic susceptibility material
IT Fluoropolymers, uses
(binder; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT Pitch
(carbon; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT Oxides (inorganic), uses
Selenides
Sulfides, uses
Tellurides
(lithiated; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT Alkali metals, uses
Alkaline earth metals
Carbon black, uses
Coke
Group IIIB elements
(lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT **Secondary batteries**
(lithium; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT Titanium alloy
(casing; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 12597-69-2, Steel, uses
(Ni-plated, **anode current collector**; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 7440-02-0, Nickel, uses **7440-50-8, Copper**, uses 12597-68-1, Stainless steel, uses
(**anode current collector**; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 24937-79-9, Pvdf
(binder; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 7440-32-6, Titanium, uses **11107-04-3 11109-50-5 11134-23-9 12611-86-8**
(casing; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 7429-90-5, Aluminum, uses
(**cathode current collector**; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 7440-44-0, Glassy carbon, uses
(glassy; lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)
IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene **carbonate** 105-58-8 108-32-7, Propylene **carbonate** 616-38-6,

Dimethyl **carbonate** 623-53-0, Ethyl methyl **carbonate** 623-96-1, Dipropyl **carbonate** 872-36-6, Vinylene **carbonate** 4437-85-8, Butylene **carbonate** 7439-89-6D, Iron, chalcogenides, lithiated, uses 7439-93-2, Lithium, uses 7439-96-5D, Manganese, chalcogenides, lithiated, uses 7439-98-7D, Molybdenum, chalcogenides, lithiated, uses 7440-02-0D, Nickel, chalcogenides, lithiated, uses 7440-03-1D, Niobium, chalcogenides, lithiated, uses 7440-32-6D, Titanium, chalcogenides, lithiated, uses 7440-47-3D, Chromium, chalcogenides, lithiated, uses 7440-48-4D, Cobalt, chalcogenides, lithiated, uses **7440-50-8D**, **Copper**, chalcogenides, lithiated, uses 7440-62-2D, Vanadium, chalcogenides, lithiated, uses 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide colio2 35363-40-7, Ethyl propyl **carbonate** 56525-42-9, Methyl propyl **carbonate**
(lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)

IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses
(lithium-ion secondary **battery** constructed of low magnetic susceptibility materials)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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=> d his nofile

     (FILE 'HOME' ENTERED AT 09:19:43 ON 14 AUG 2007)

     FILE 'HCAPLUS' ENTERED AT 09:19:52 ON 14 AUG 2007
L1             1 SEA ABB=ON  PLU=ON  US20040151987/PN
                 SEL RN

     FILE 'REGISTRY' ENTERED AT 09:20:11 ON 14 AUG 2007
L2            13 SEA ABB=ON  PLU=ON  (108-32-7/BI OR 12190-79-3/BI OR
                 12645-62-4/BI OR 12668-36-9/BI OR 21324-40-3/BI OR
                 4427-96-7/BI OR 616-38-6/BI OR 7440-21-3/BI OR 7440-31-5/BI
                  OR 7440-50-8/BI OR 7782-42-5/BI OR 872-36-6/BI OR
                 96-49-1/BI)
                 E VINYLETHYLENE CARBONATE/CN
L3             1 SEA ABB=ON  PLU=ON  "VINYLETHYLENE CARBONATE"/CN
                 E COPPER/CN
L4             1 SEA ABB=ON  PLU=ON  COPPER/CN
                 E SILICON/CN
L5             1 SEA ABB=ON  PLU=ON  SILICON/CN
L6         78262 SEA ABB=ON  PLU=ON  SILICON?/CN
L7            11 SEA ABB=ON  PLU=ON  VINYLETHYLENE CARBONATE?/CN

     FILE 'HCAPLUS' ENTERED AT 09:24:11 ON 14 AUG 2007
L8       1256158 SEA ABB=ON  PLU=ON  L4 OR COPPER OR CU
L9       1448948 SEA ABB=ON  PLU=ON  L5 OR L6 OR SILICON?
L10          265 SEA ABB=ON  PLU=ON  L3 OR L7 OR  VINYLETHYLENE CARBONAT?
L11           26 SEA ABB=ON  PLU=ON  L3/D  OR L3/DP OR L7/DP OR L7/D
L12          265 SEA ABB=ON  PLU=ON  L10 OR L11
                 E  BATTERY ANODES/CT
L13        18754 SEA ABB=ON  PLU=ON  "BATTERY ANODES"+PFT,NT,OLD,NEW/CT
L14         2727 SEA ABB=ON  PLU=ON  L8 AND L13
L15            1 SEA ABB=ON  PLU=ON  L14 AND L1
L16            3 SEA ABB=ON  PLU=ON  L14 AND L12
                 E   SECONDARY BATTERIES/CT
L17        71789 SEA ABB=ON  PLU=ON  "SECONDARY BATTERIES"+PFT,NT,OLD,NEW/CT

L18           10 SEA ABB=ON  PLU=ON  L8 AND L12 AND L17
L19           10 SEA ABB=ON  PLU=ON  L8 AND L12 AND (BATTER? OR ANOD? OR
                 CATHOD? OR ELECTROD?)
L20           10 SEA ABB=ON  PLU=ON  L18 OR L19
L21            3 SEA ABB=ON  PLU=ON  L20 AND L9
L22           10 SEA ABB=ON  PLU=ON  L15 OR L16 OR L20 OR L21
L23       121454 SEA ABB=ON  PLU=ON  L8 AND (L13 OR L17 OR BATTER? OR ANOD?
                 OR CATHOD? OR ELECTROD?)
L24        13595 SEA ABB=ON  PLU=ON  L23 AND L9
L25            3 SEA ABB=ON  PLU=ON  L24 AND L12
L26          645 SEA ABB=ON  PLU=ON  L24 AND  (CURRENT COLLECT? OR COLLECT?)
L27          467 SEA ABB=ON  PLU=ON  L26 AND ELECTROCHEM?/SC,SX
L28            3 SEA ABB=ON  PLU=ON  L27 AND CYCLIC CARBONAT?
L29            7 SEA ABB=ON  PLU=ON  L24 AND CYCLIC CARBONAT?
L30           14 SEA ABB=ON  PLU=ON  L22 OR L25 OR L28 OR L29
L31           48 SEA ABB=ON  PLU=ON  L27 AND NEGATIVE ELECTROD?
L32           37 SEA ABB=ON  PLU=ON  L31 AND CURRENT?
L33           36 SEA ABB=ON  PLU=ON  L31 AND CURRENT COLLECT?
L34           36 SEA ABB=ON  PLU=ON  L33 NOT L30
L35            0 SEA ABB=ON  PLU=ON  L34 AND L12
L36           36 SEA ABB=ON  PLU=ON  L34 AND  L9
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| | | | | |
|---|---|---|---|---|
| L37 | 0 | SEA ABB=ON | PLU=ON | L36 AND L12 |
| L38 | 0 | SEA ABB=ON | PLU=ON | L36 AND CYCLIC CARBONAT? |
| L39 | 0 | SEA ABB=ON | PLU=ON | L36 AND CYCLIC(2A)CARBONAT? |
| L40 | 19 | SEA ABB=ON | PLU=ON | L36 AND CARBONAT? |
| L41 | 36 | SEA ABB=ON | PLU=ON | (L36 OR L37 OR L38 OR L39 OR L40) |
| L42 | 163 | SEA ABB=ON | PLU=ON | L12 AND (L13 OR L17 OR BATTER? OR ANOD? OR CATHOD? OR ELECTROD?) |
| L43 | 1 | SEA ABB=ON | PLU=ON | L42 AND COPPER FOIL? |
| L44 | 10 | SEA ABB=ON | PLU=ON | L42 AND L8 |
| L45 | 18 | SEA ABB=ON | PLU=ON | L42 AND L9 |
| L46 | 109 | SEA ABB=ON | PLU=ON | L42 AND (NEGATIVE ELECTROD? OR ANOD?) |
| L47 | 2 | SEA ABB=ON | PLU=ON | L46 AND CURRENT(A)COLLECT? |
| L48 | 6 | SEA ABB=ON | PLU=ON | L46 AND COLLECT? |
| L49 | 13 | SEA ABB=ON | PLU=ON | L43 OR L44 OR L47 OR L48 |
| L50 | 17 | SEA ABB=ON | PLU=ON | L49 OR L30 |
| L51 | 36 | SEA ABB=ON | PLU=ON | L41 NOT |